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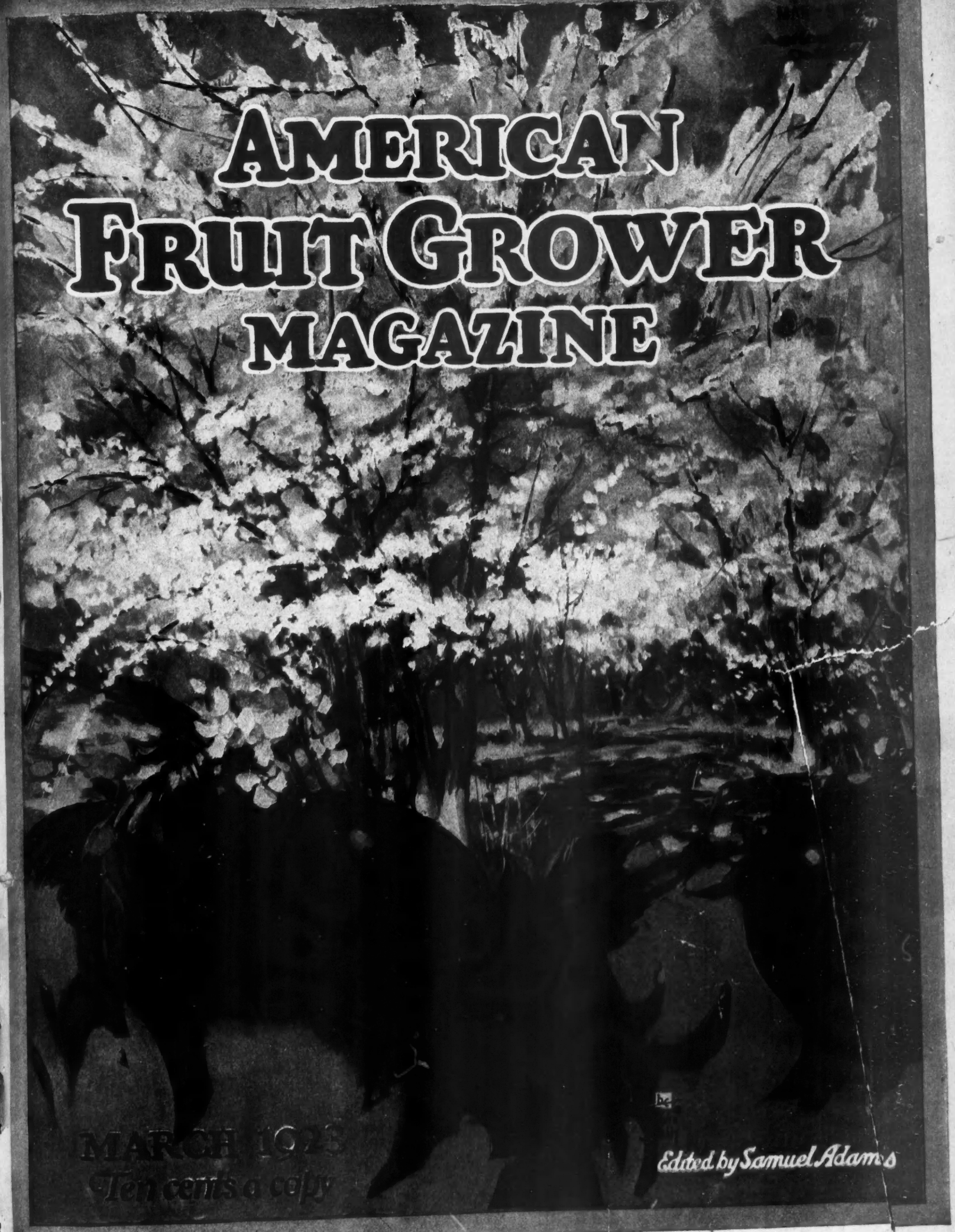

# AMERICAN FRUIT GROWER MAGAZINE

MARCH 1923

Ten cents a copy

Edited by Samuel Adams

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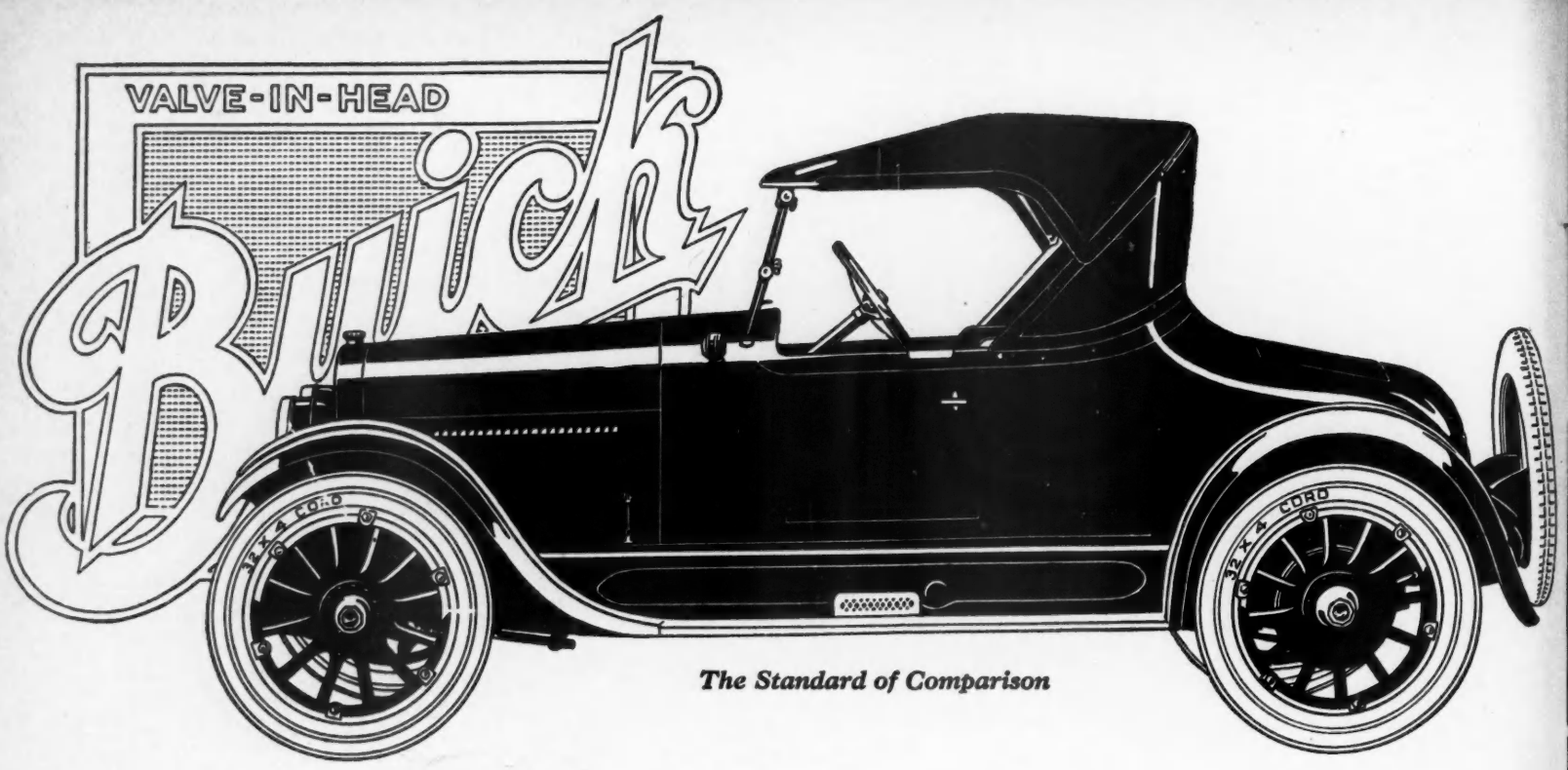


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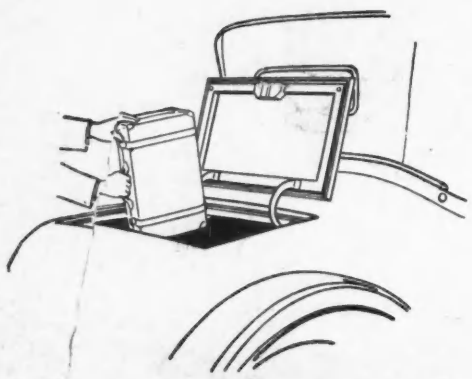

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# Orchard Heating in Roque River Valley

## *By C. C. Cate*

ORCHARD heating in the Rogue River Valley of Southern Oregon has been practiced for the past fifteen years. Heating orchards during the spring of the year when trees are in blossom and for two or three weeks thereafter, should be considered as an insurance policy.

The volume as well as the quality of the fruit is determined to a great degree when the trees first come into bloom. Due to the fact that frosts very seldom hit with the same degree of severity each year, some growers are prone to gamble with the weather and trust to good fortune that the frost will not damage their particular crop. And to a certain extent many orchardists in the Rogue River Valley, as is probably the case in all fruit districts, may not need to heat on account of the topography of their respective orchards.

But in the Rogue, as in all sections of the globe, where de luxe fruit is grown, there are times and places when and where it pays to heat orchards and other crops, to insure maximum returns of both quality and quantity.

A good orchardist, like a good business man, leaves no stone unturned that will spell efficiency and insure the maximum cash returns for his business.

For centuries man has searched the globe for agricultural districts that offer perfect climatic conditions for the development of food products, but up to the present, no such district has been located. There is always some obstacle or barrier to overcome, and when fruit districts have been developed to such extents as we find in many sections of the United States, it behooves the orchardists to assist the weather man to bring about as nearly perfect conditions as is possible. Orchard heating, when other conditions are right for maximum crop production, is one way to insure good interest on money invested and may in many seasons be the means of saving not only the season's crop, but the orchards of many years standing, as was noticed in many citrus groves of the state of California last season.

How Jack Frost mal-forms pears. The three in lower left hand corner are the only normal ones.

### Temperatures That Cause Damage

A great deal has been written and said regarding damaging temperatures and more or less experimental work has been conducted along this line in various parts of the United States. For the past 5 years the writer and Mr. Floyd D. Young of the Weather Bureau have been working to compile data regarding actual damages that occur in the orchards. It is very difficult to obtain data of this kind, due to the fact that there is only about a week or ten days during each year that such data can be compiled, and due to the fact that each year the temperatures and the stages of development of the fruit buds are different, and it requires many years to accumulate data that will be worth publishing.

We have found in our work that there are many factors that enter into the damage caused by frost. One of the principal factors is that of the development of the fruit buds. It has long been known that the fruit buds in different stages will stand different temperatures. In this valley very little firing is done in the orchards until the trees come into blossom and we have checked up this factor and find that there are times when it will pay to fire before the buds open into full bloom. We recorded temperatures as low as 20° when the fruit was in full bloom and still find that we have a pretty fair setting of fruit. On the other hand, we have found that we have had very serious damages when the temperature was as low as 24°.

Other climatic conditions will enter into this phase of damage as well as the stage of development of the fruit buds.

We have found that we can have quite low temperatures with plenty of moisture in the atmosphere and not have the amount of damage that we would if we had low humidity and a very dry atmosphere.

The recommendations we make for firing in the Rogue River Valley are about as follows: Plan to start up firing when the pear blossoms are just beginning to break open after they have separated into clusters. There will be a difference in the varities—with the Bosc as the most tender variety, and firing should start on Bosc at about 29°. With varieties such as Bartletts, Anjous and Comice, it is not necessary for firing until the

Anjou pears protected by heating, averaging 12 boxes to the tree. Check trees averaged only one box.

Howell pears protected by heating, averaging 13 boxes per tree. Check trees averaged less than one box per tree.

Comice pears with fruit only in the top of tree. Frost killed practically all fruit in the lower half of tree due to insufficient heating.

temperature reaches 28°. Winter Nelis will stand a little more in this stage and firing may be held off until the temperature reaches 27°. After the fruits are in full bloom we usually try to have all firing started by the time the temperature gets to 28°.

### Various Kinds of Damage

Damage to fruit may appear in various forms from that of total killing to just merely marking of some of the individual fruits. In our experience we have had in some orchards a total loss, due to frost and varying from that to practically no loss at all. One other serious damage that is sometimes overlooked by the orchardist is that of pollination. If frost occurs just at the time the fruits are pollinating temperatures of 28° may do serious damage to varieties that are difficult to pollinate. After the fruit is thoroughly pollinized we find that it will stand a little more freezing. Then the damage is in the freezing or the killing of the seeds. A great deal of loss may occur to the orchards from this cause and the fruits will continue to hang on many times until picking. Other times this fruit so damaged will shed heavily during June and July. Although this fruit may hang on until maturity, seedless fruit is never considered first class fruit, due to the fact that the development of the fruit is usually near the stem and the fruit does not develop normally and may be all shapes and sizes.

Cold temperatures may cause misshapen fruit of many kinds, as indicated in the photograph displayed.

One of the most noticeable effects of frost is that of russeting or ringmarked fruit. This russeting or ringing may occur before the fruit has broken into blossoms, or after the fruit has shed its blossoms. This kind of damage is one of the most noticeable in our valley. The cold may not be severe enough to kill the seed and the fruit will hang on until maturity, but will be very badly russeted. Trees may carry a full load of this kind of fruit and will not feel the effects of the freeze until returns come in from your markets.

Many crops of fruit are harvested each year where heating has not been practiced, when from 25 to 75% of the crop will go into fancy grade on account of russeting from frost. There is usually a difference of from 25 to 75 cents a box between fancy and extra fancy fruit.

### Smudging or Heating Equipment

The equipment needed for orchard heating in the Rogue River Valley is quite different from that equipment used in heating citrus groves in California. The frost season in the Rogue River Valley is usually late in the spring and the duration of the cold is not so long as that of the citrus belt, where firing must be conducted during the middle of the winter. On account of this fact it is not necessary to equip all orchards with heaters that will have to be burned all night. The longest period that we are likely to have is four or five hours, and for this reason the growers can conduct their orchard heating with the lard pail type heaters which burn from two and a half to three and a half hours. However I feel that there is a place for the Scheu heater type, and we are using these in some orchards in the valley. These heaters will hold from five to ten gallons of oil and will burn from five to ten hours. This type of heater does not throw off very much smoke but throws out a great deal of heat. They are much more expensive than the lard pail type and when 30 or 40 are provided for each acre it makes it quite expensive for the orchardist. Before recommending this type of heater to our orchardists I thought it best to conduct some experiments with the two types of heaters before making a definite recommendation. From our past experience with both types of heaters I feel at this time that the Scheu heater has a place in this valley, but I would work it in combination with the lard pail type.

By using from 15 to 20 of the Scheu heaters per acre and filling in the intersections remaining with two lard pail heaters in every intersection, I feel that we have a combination that will insure us against any kind of frost that we may have. By using this combination from 20 to 30 of the lard pail pots may be lighted to create a smudge and many times this will hold the temperature for one or two hours before it is necessary to light the other heaters. Then in case it is a cold night, the Scheu heaters may be lighted and will burn until morning.

Comice pears. Fruit distributed over entire tree due to proper heating.

Orchard heaters in operation in author's orchard. Thirty-five heaters per acre, 17 heaters per acre burning. Photo taken just before sun up. Fifteen acres were equipped with heaters and 15 acres with smudge pots for comparison in efficiency and cost.

There are also other nights when it is only necessary to fire from one to two hours and when the Scheu heaters have to be lighted for this time it makes it quite expensive, as this type of heater is much more difficult to light than the lard pail type.

Where smudge pots alone are used I would recommend the placing of two or three pots in each intersection. This will give from 100 to 150 pots per acre.

During our average frost it will only be necessary to light about 30 pots per acre. These will burn for about two and a half hours and then an additional number can be lighted. By having these heaters filled and in the orchard the grower is assured that he will have a sufficient number of heaters to carry him through the coldest night without having to refill during the night.

A great deal of dissatisfaction among orchardists from orchard heating is the fact that they have not been equipped with enough heaters of any type to guard against the most severe frost. There is nothing much more discouraging than putting in a long night, firing all the heaters you have, and then find in the morning that you have not raised the temperature sufficiently to save your crop. We feel that the worst frost we have ever had in the past 15 years could have been handled successfully in the Rogue River Valley with from 50 to 75 pots burning per acre.

### Kinds of Oil to Use

A great deal of work has been done in the past in regard to the best kind

(Continued on page 13)

# Apples or Aprons—Oranges or Organdies

## By S. H. Burton

WHEN the United States Bureau of Entomology discovered that the boll weevil was a thirsty little scoundrel and that he could be poisoned by placing a small amount of arsenic in his drinking water, it brought new hopes to the South and brought back infested cotton areas to again hear the song of the Darky and the hum of the cotton gin.

However, with this discovery came a new demand for arsenic in ever increasing quantities. Manufacturers of arsenate of lead, chiefly used in the fruit growing industry, began to turn out calcium arsenate to supply this demand. What effect this increased consumption of arsenic by the cotton industry is going to have on the fruit interests of the United States is problematical.

If the demand for cotton goods keeps up—if the price of cotton keeps soaring—if the cotton farmer can pay more for the arsenic to protect his crop than the fruit grower can afford—then we will be sacrificing our apples for aprons and our oranges for organdies. Or if we care to figure the other way round—and apples and oranges become scarce and high in price—we may see the cotton farmer figuring on the cost of a bushel of apples or a box of oranges—if they are high in price he will figure he cannot compete with the fruit grower in his bid for arsenicals. If fruits are cheap then the cotton farmer can figure that his cotton is worth saving by robbing the fruit industry, for there is no question but what there is a world shortage of arsenic and not enough to go around to all industries.

In the past, the world supply of raw arsenic was ample for all needs. The high prices for raw cotton has encouraged the grower to better protect his crop and the resulting demand for calcium arsenate for protection against the boll weevil has completely reversed the situation and we are facing a shortage of raw arsenic for the season of 1923 and for several years to come. This demand of the cotton grower is going to result in a serious shortage of arsenate of lead for the fruit grower, as the basic element in both arsenate of lead and calcium arsenate is arsenic.

Under ordinary conditions, manufacturers of arsenate of lead have produced enough to take care of normal demands and after that has been produced they have been turning their plants over to the manufacture of calcium arsenate to meet the demands of the cotton grower who has learned that even in infested weevil territory by intensive cultivation and the use of arsenicals he can still grow cotton profitably at present prices.

Quoting from a recent article in the New York Chamber of Commerce, a prominent Georgia grower was questioned in regard to his method of growing cotton successfully, and he said that high fertilization, frequent cultivation and the dusting with calcium arsenate was the secret of his success. He is a firm believer in the use of poison for the control of the weevil and says he would not undertake to raise cotton without it. He says that any farmer who makes a half bale of cotton per acre without poison can make a bale to the acre with poison.

When one considers that the cotton farmers demand for arsenic has increased beyond the world supply of available arsenic it would not be surprising if the apple consumer finds a worm in his apple next winter.

### Source of Arsenic

White arsenic or commercial arsenic which is the basic poison for most of our insecticides and cattle dips, is a by-product of smelters that handle copper, silver and other ores. Under a process of electrical precipitation, the crude arsenic is collected from the smelter flues. Before the modern Cottrell process of electrical precipitation was discovered the arsenical fumes from the smelters killed all vegetation within miles of the plant. White arsenic being a by-product of these smelting plants, the smelters are not interested in increasing the output beyond the daily capacity of their smelting operations, and as the cost of production has always been low, and the demand has not kept pace with the output it has not been an attractive undertaking from the manufacturers point of view. Another thing—the raw arsenic as it comes from the smelters must undergo a refining process before being

(Continued on page 15)

# Is the Baldwin Losing Ground?

By J. H. Gourley, Ohio Experiment Station

Typical fall scene in Baldwin orchard

TRADITION and sentiment play large parts in the lives of most of us, and rightly so. In the main we must be practical but in moments of reflection our enjoyment comes from an appreciation of the persons and things we have favorably known in the past—hence, (with certain obvious reservations) we find the old toast still popular—

Old wood to burn,
Old books to read
Old wine to drink,
Old friends to trust.

It is with some such feeling that I contemplate the subject of this article—Is the Baldwin apple losing ground? For nearly 180 years this fruit has been a part of the life of the people of certain sections of the United States and Canada, just as Hawthorne's Great Stone Face became interwoven into the lives of the folks who lived in that little valley in the White Mountains and saw it from day to day. For many years fruit growing in New England meant apple growing, and apple growing meant Baldwin growing. The same was largely true of parts of New York State and northern Ohio and it was not unfamiliar to those living in more remote parts. There is no more venerable patriarch in all appledom than this one. Therefore, we may be pardoned for making reference to the human side of this apple before attempting to discuss whether or not it is about to sing its "swan-song."

Recently the horticultural press has contained arguments, pro and con, regarding the "running out" of this old apple. Evidently there is a wide divergence of opinion and it would be unsafe to say at this time which side of the controversy has the more adherents. But it is a worth-while discussion and one in which fruit growers generally should be interested because it has a wider application than to this one variety. It raises the age-old question, *do varieties run out?* Are we sooner or later to lose through old age and death such old favorites as the Elberta peach, the Bartlett pear, the Concord grape, and the Reine Claude plum?

### The Point at Issue

In the first place it would be well to define what point is at issue before attempting a discussion of the matter. The title of this article, as suggested by the managing editor of the American Fruit Grower might imply, in various minds, either of two suggestions. First, are better varieties taking its place, or second, is its constitution weakening; is it more susceptible to disease than formerly, i. e., is it "running out?" Perhaps it would be well to consider the question from both of these points of view, although it is the latter one which we have particularly in mind.

### History of Baldwin

Historians tell us that the Baldwin came up as a chance seedling near Lowell, Mass., about 1740. It was widely introduced through eastern Massachusetts by 1784 and was known at different times by at least three names. The original tree perished some time between 1817 and 1832. The variety was widely planted in New York State from 1850 to 1870 and soon became the leading one in Western New York which distinction it still holds. That it has added millions of dollars to the income of farmers and fruit growers of the northeastern United States is patent to any who have followed the yield and income from the old orchards of that region. That it should now face a day of reckoning, be compared in a perfectly cold-blooded fashion with the best kinds available for commercial planting, is not to be wondered at. If it cannot stand this test then it must give place to the better sorts, for the coming generations will not long consider sentiment, old lavender, or furniture from the Mayflower, out of respect for antiquity; it must produce "the goods."

### The Baldwin Pro and Con

What are the merits and demerits of this variety, and do the former outweigh the latter? Because of difference in behavior under varying conditions, it is not easy to answer definitely. Our judgments should not be confused by those who rashly condemn and force the pendulum out of

Such a decadent family orchard of Baldwins is a common sight throughout New England. Lack of spraying and poor cultural conditions are the cause.

A Baldwin orchard in grass mulch at New Hampshire Experiment Station. Average yield 83 barrels to the acre.

its natural course only to find at a later time that the real merits of the case prevail.

The commercial standing of the Baldwin is well defined in a recent work in which it is critically discussed by authors who have watched comparative variety behavior over the entire country for a period of years. "Approximately 50 percent of the commercial apple production in New York and New England consists of Baldwins. The question of selecting Baldwin for commercial planting outside of this region should be considered very carefully but within these confines it is almost invariably a wise choice * * * *. The tree is strong, large and vigorous, the many old Baldwin orchards in western New York testifying to its longevity. While somewhat late in coming into full bearing and once matured inclined to biennial inbearing, in total production the Baldwin is one of the heavy bearers, and in commercial importance it stands preeminent. The fruit is of good quality, stands shipment and keeps comparatively well, although it sometimes develops Baldwin spot both before and after picking."

Stripped of detail, it has been popular because it has been a money maker. It is usually long lived, a tremendous bearer, and the fruit is acceptable for dessert and culinary purposes; because of its color and keeping qualities it is very popular as an export apple. We might add that it is adapted to both high class apple production and to "apple farming," the latter being an environment in which it has often found itself. Of course its name or reputation has been no small factor in holding the market, even in years when the quality was poor, for the old adage, "nothing succeeds like success," applies to apples as well as people. On the contrary there are some serious defects which properly raise the question whether the variety should continue to be planted commercially. Perhaps the outstanding one is susceptibility to injury from low temperatures.

### Subject to Winter Injury

Under favorable conditions it is a strong grower and also requires a long season for maturity. Frequently the leaves are held well into the winter which indicates slow maturity. Such a condition favors killing of the tissues when the temperature drops to 20° F. If there is a sudden drop in temperature early in the winter the injury may occur at a higher degree than when the freeze occurs later. This combination of circumstances occurred both in 1906 and 1917. Serious damage occurred also in the winter of 1911-12.

The extent of this injury varies from killing of the terminal buds, to cracking and killing of the twigs and branches, and also to killing of large portions of the trunk or the outright killing of the entire tree. If the ground is bare of snow or vegetation the roots will also be killed as the roots of any apple tree are much more tender than the parts above ground. The prevalence of black rot canker on the limbs is no doubt related to the injury from freezing as an entrance for the disease spores is made by the drying and cracking of the bark from winter injury.

Winter injury on the trunk of a Baldwin apple tree. This injury is not uncommon in New England. (By courtesy of MacMillan & Co., New York.)

### The Baldwin Spot

A second serious weakness and one which would be placed on a parity with that of freezing is its susceptibility to stipend or "Baldwin spot." This trouble may show as depressions on the surface or it may develop within the flesh and extend more or less throughout the fleshy portion. The dry, spongy mass is often rather bitter and is brown in color. It is termed a physiological break-down since neither insect nor fungus is responsible. The trouble may be serious some seasons, nearly ruining the crop, and entirely absent other years. It may develop to considerable proportions on the tree or else almost entirely in storage. But fortunately there are many orchards in which this trouble has never been prevalent which indicates that it is due to environmental conditions and not to a running out of the variety. Again it is argued that the variety does not bear as it once did—even a comparatively few years ago. For some sections I am sure this is true, but I believe it to be due to injury from cold, which, strange to say, has not manifested itself in other ways with those trees. It would be asinine to attempt to argue that the variety has not fallen off in yield in some sections of the country or that the same thing would not occur again, for we know that it will and for the same reason as in the past. But on the other hand there are many places where this has not occurred, or at least it still is making a yield record which will compare favorably with the other standard sorts. As suggested before, it is hardly necessary to try to prove that the Baldwin is naturally a heavy bearer but it is pertinent to show that the reported troubles are by no means universal and that the variety is still yielding so well that such a thing as senility or degeneration in the variety as a whole has not taken place.

First referring to Northern Ohio, it is clear that the Baldwin has frequently suffered in severe winters, for I have seen unquestionable evidences of it for years. I have therefore examined the record of six trees on the Station grounds that are now 30 years old and hence went through the winters of 1906, 1911 and 1917. There have been three bearing years since

(Continued on page 14)

A renovated Baldwin orchard where tillage is used.

# Conveniences for Hillside Spraying

*By C. I. Lewis*

DALEVIEW FARM in southeastern Licking County in the central part of Ohio, the heart of the hill country, is well worth visiting. This farm belongs to F. H. Ballou of the Ohio Agricultural Experiment Station, to whom we are especially indebted for notes and photographs concerning Daleview Farm. Few men in the country have made a closer study of orcharding especially adapted to hilly sections than Prof. Ballou of the Ohio Experiment Station. He has worked out special methods for maintaining the moisture and fertility of the soil and during the past few years he has made a special study of spraying, especially spraying equipment and conveniences.

Too often in the hill orchards country, the water supply for spraying must be obtained from a well where the water is pumped by hand into buckets and poured into the spray tank. This is a slow, tedious and expensive process. Spray rigs must then be pulled up the side of the hill and at certain seasons of the year this is a hard task. Prof. Ballou felt that there are many farms where this is not necessary and on his 20-acre Daleview Farm orchard he has taken advantage of the fact that water will always run downhill if you but give it a chance and that it is much easier to pull the heavy load downhill and the empty sprayer uphill than to reverse the process.

One of the several filling stations that are situated at different elevations on the orchard hillside.

### Hillside Driveway

To handle the work effectively on a hillside orchard Mr. Ballou has demonstrated that it is very desirable that permanent, definite roads be built and that these roads or driveways should be graded every fourth or sixth row throughout the steeper portions of the orchard. The work can be rather rapidly performed if there are not too many stones or stumps by using an ordinary raking plow or a side-hill plow and following this by the use of a short road drag.

In plowing he first plows three or four furrows midway between two rows of trees, the first or lowest furrow being shallow and each additional furrow slightly deeper than the preceding one. The short steel road drag is used on the plowed strip, the cutting edges of the drag being so set at an angle that the freshly broken ground will gradually be worked aside and downward. After the loose earth has been cleared away from the newly cut passageway, it is sometimes necessary to keep the upper edge by plowing an additional furrow or two and dragging it as before. By this process a firm road-bed will soon be formed.

### The Water Supply

To obtain a good water supply on Daleview Farm a splendid spring on the side of the hill has been utilized. The water flows up through a large stone box, flowing into a small concrete tank, which serves as a sort of ice chest or food cooler for the farm. The water then passes into a large 400-gallon concrete tank. Here a double action power pump and a small gasoline engine are brought into play. A 1½ inch suction pipe containing check valves at its lower extremity reaches from the bottom of the power pump to the bottom of the large concrete tank and pumps the water to the top of the hill through a one inch galvanized iron pipe. This pipe passes beneath the surface of the ground to a 300-gallon metal tank on the side of the hill. This has very recently been displaced, however, by a large concrete cistern.

Along the driveway hydrants are installed. These are controlled by a globe valve. By the use of one inch hose the spray tank can be very rapidly filled by gravity. This system also supplies the water for the farm buildings and for the lawn and at the buildings a pressure of 80 pounds to the square inch is obtained. This water pressure in the home means a great deal and is greatly to be desired in every orchard home.

Mr. Ballou is very enthusiastic over the results he has obtained and is planning in the near future to enlarge and improve this system.

### The Spraying Outfit

For hillside orchards experience has shown in central Ohio that the rake should represent lightness, strength, simplicity and ability to maintain high pressure, coupled with low weight. The outfit should be hung low so that it will not upset easily and it should be so constructed that it will turn around in a small radius. In addition to this on the steep hills it is very desirable that a very good brake should be provided. For hose, Mr. Ballou uses two runs of 125 feet each, this hose being about 3-16 of an inch in bore. This makes a more convenient hose to handle on the side hill than the heavier hose. With this outfit he is able to maintain a high pressure both at the pump and at the nozzle and is able to use a gun and obtain a mist spray, which gives him very effective control.

There are a great many fruit farms throughout the United States where a system similar to that installed at Daleview Farm could be easily copied and it would mean a great deal in the economy of production, cheaper and more efficient spraying and in addition one would have the comforts which come from the use of high pressure water in the farm buildings.

### Other Ohio Farms

Ohio has very many attractive fruit farms. One which it will pay to visit is the farm of W. W. Farnsworth of Waterville. The Farnsworths have 175 acres of fruit and about 75 acres of farm land. They have a diversified fruit proposition, consisting of apples, pears and plums. For apples they grow the Rome, Grimes and Jonathan as their main varieties, although others are produced. For pears the Bartlett has been the main crop, with some Seckels for pollenation, and they have a few Kieffers. Plums are found to be quite profitable. Mr. Farnsworth chooses those varieties which naturally do not succumb to brown rot as bad as others. He has found the French Damson to be a very good plum of its type. It produces large fruit and is a good producer. He also grows some of the Grand Dukes and some prunes.

Situated as Mr. Farnsworth is, in a natural market district, where by the use of auto trucks he can sell all that he produces within 100 miles of the farm, it is to his interest to produce a larger variety than one would grow in confining their efforts to shipping by carload.

He keeps the old orchard in sod and maintains the fertility of the soil by adding stable manure liberally. He obtains this manure by buying several carloads of steers in the fall, which he fattens. Alfalfa, straw, hay and silage are used to put the steers into condition. A large amount of manure is secured in this way and it is a very fine proposition for the orchard. Mr. Farnsworth uses manure spreaders and in this way he can give his general help something to do all through the winter.

He believes in plenty of power on the farm. He uses a tractor in the tillage of his young orchard. All his young trees are kept in clean tillage. The tractor is also used to pull the big 10 horsepower sprayer through the orchard. Mr. Farnsworth has demonstrated that for his conditions high power with spray guns will give him good control. For hauling fruit to market he finds the auto trucks to come in very handy.

In addition to growing fruit the Farnsworths find that it is possible to be of general service to their community. Mr. W. W. Farnsworth has been identified with the American Pomological Society for years and is one of the trustees. W. G. Farnsworth was also one of the committee of twenty-one to work out a marketing plan for handling fruit. He recently ran for the State Senate and was elected by 7000 majority. The Farnsworths also make it a point to attend all the horticultural society meetings and exhibits that they can possibly reach.

States like Ohio and Indiana are unusually well situated for marketing all the fruits which they can grow to a good commercial standard. The large manufacturing cities in that district are eager for fresh fruits and the man who attends to business can make a success of fruit growing in these states.

Undoubtedly thousands of our readers are making labor saving experiments in just the same way as our Mr. Ballou and Mr. Farnsworth. Every attempt should be made to lower costs of production and to save labor by the establishment of water distribution systems, economical spray mixing plants and the adoption of up-to-date machinery. We would be delighted to have our readers write to us and tell us in detail just what they have done to make work easier or what they have accomplished in lowering their cost of production by the utilization of new ideas in their orchards. We are anxious to give our readers the benefit of the rich experience of our thousands of readers who are constantly seeking better results in their orchards. To a large extent the great development in our American horticulture is due to the willingness of our growers to try new things and pass on the rich benefits of their experience to their fellowmen.

Grading a hillside orchard driveway in central Ohio. Stayman apple trees at the left, Delicious apple trees at the right.

Three hundred gallon metal tank on the orchard hill now being replaced by cement reservoir.

Spraying on a steep slope at Daleview Farm. (Photos courtesy Ohio Experiment Station.)

# History of the Washington Navel Orange

*By Carl S. Pomery*

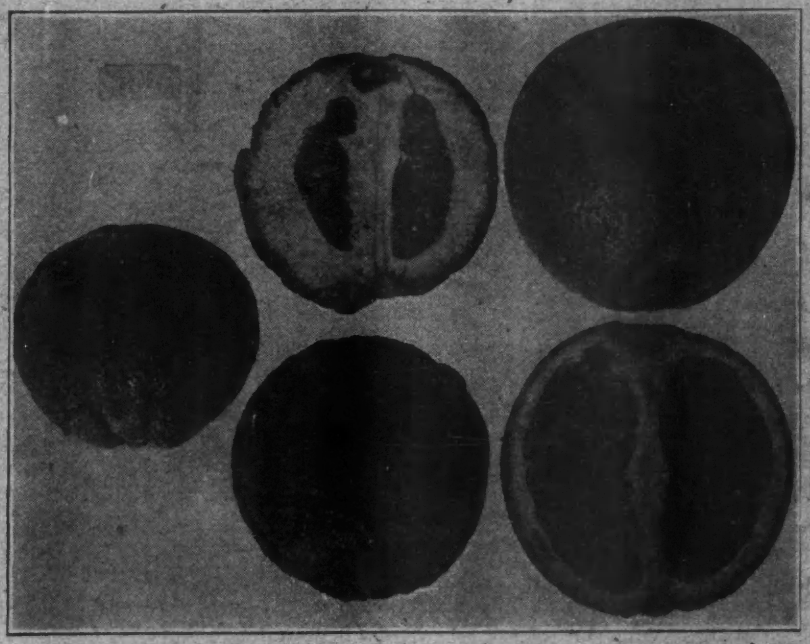
THE story of the origin and development of the Washington Navel orange industry is perhaps more interesting and unique than a similar account of the history of any other horticultural product grown commercially in the United States. From the introduction of about a dozen small plants in 1870 the plantings of this fruit have expanded in fifty years to the present development of over one hundred thousand acres in California and Arizona and commercial plantings in several foreign countries. Pronagations for this development have been made entirely from two trees in California and their progeny and one of the orginal California trees is still alive the second one having died about a year ago. We thus have a large and profitable industry firmly established with its product known throughout the world while the parent trees of the industry still remain vigorous and productive.

The origin of the Washington Navel orange was ascertained by an expedition of agricultural exploration from the United States Department of Agriculture to Brazil in 1913. It originated at Bahia, Brazil in the early part of the nineteenth century as a bud sport or mutation from the Selecta orange which is a seeded variety something like our common Valencia. No definite records could be found to establish this fact but accounts of the early history of the navel orange which had been handed down from one generation to another were secured from several sources and all agreed regarding the salient points. The most complete and probably the most accurate statement was that furnished by the Reverend W. A. Waddell, a Presbyterian missionary who had lived for years in the vicinity of Bahia and who had been much interested in this subject. His account is as follows:— "Twenty years ago an old man, a very intelligent cabinetmaker, told me that in his youth, before the independence of Brazil, the laranja de umbigo (navel orange) was found only in some groves in Cabulla. He, as a boy soldier, in company with his comrades, "chupou muitas" (ate many) during the siege of Bahia, being stationed in a grove that contained some trees. Most of his comrades had never seen them before, but he had seen them sold by the slaves of a Portuguese. He had heard that a "mandinga" woman charmed a seed and made the first tree yield "unbigoed" fruit. This was information gathered when he was young, say, 1816 or 1818. I came to the conclusion that the seedling tree originated in Cabulla in 1810-1820, or perhaps even earlier, and was first propagated by a Portuguese grower, and that in 1822, the year of Brazilian independence, there was quite a lot of trees. Of course the production of any odd-shaped fruit would be explained by fetichism among the lower classes."

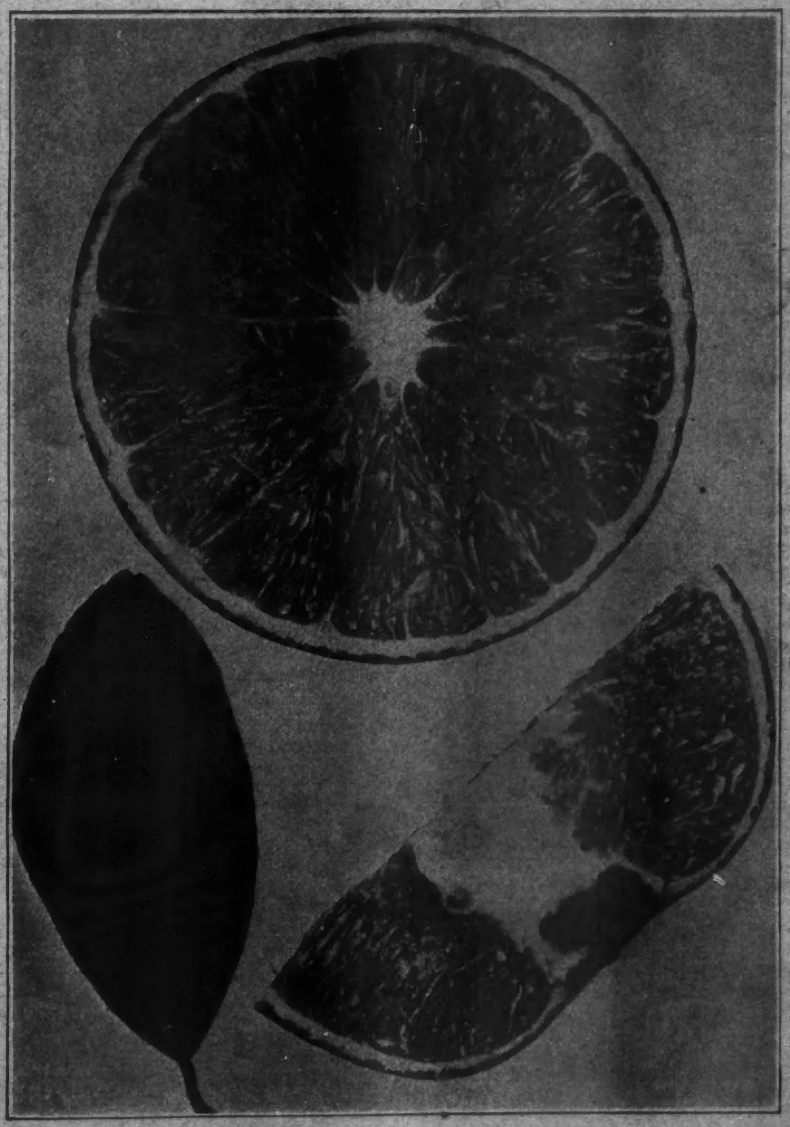
### Originated As a Sport

It will be noted that Dr. Waddell speaks of the "seedling tree" which originated in Cabulla. However, all definite evidence indicates that the variety originated as a sport of the Selecta. The Selecta is almost identical with the navel orange as grown in Brazil and frequently shows a tendency to produce navel fruits although the true Selecta variety has no indication of a navel. The Bahians themselves recognize the similarity of these two varieties and call the navel orange "Selecta de umbiga" or "Navel Selecta."

The superstitious explanation of the cause of the navel mark as described by the Brazilian soldier was not much more absurd than some similar beliefs at the present time. A few years ago the writer received a letter from parties in New York City asking for a decision on a wager they had made. One man maintained that the navel mark was caused as the result of an operation on the individual fruits for the purpose of removing the seeds. The other party was strongly opposed to any such theory but had no explanation for either the absence of the seeds or the presence of the navel mark.



**Three fruits of the Dry strain of the Washington Navel, which were borne on a limb sport in tree that is otherwise normal. This sport has been observed for thirteen years and is fixed in its character. Two standard fruits from the same tree are shown for comparison.**



**Leaf and sections of a Bahian navel orange showing the thin skin and many segments of the fruit. Photographed natural size at Bahia, in November 1913.**

The Selecta orange is not now grown to any extent at Bahia but is commercially grown in the vicinity of Rio de Janeiro and in one of the groves there the investigators of the Department of Agriculture found occasional fruits with well defined navels on trees which normally produced typical Selecta fruits. Fruits of the Selecta variety are slightly oblate in form with from fifteen to twenty seeds. In bud sport fruits showing the navels the shape of the fruit tends to become more nearly spherical and the number of seeds was reduced to an average of nine in the fruits that were examined there.

### From the Tropics

Bahia is located within the tropics and the growing season there is continuous. As a result the oranges do not normally become orange colored and they reach a large size (3½ to over 4 inches in diameter). The Bahian navel is very thin-skinned and sweet, lacking the sprightly subacid flavor which characterizes the California navels. The Bahian fruit actually has a smaller percentage of sugar than those in California but it also has much less acid so that it tastes sweeter.

The origin of the Selecta variety is more obscure than that of the Bahia navel. It has been known in Brazil since the early history of that country and was probably brought there by the Portuguese explorers and settlers and is supposed to have come originally from India.

As nearly as can be ascertained the Bahian navel orange variety was first propagated about 1820 in Bahia by a Portugese gardener who was said to be the first person in Brazil to propagate plants by budding. The superior value of the seedless navel oranges in comparison with the seedy Selecta fruits was soon recognized by the Bahians and this variety gradually supplanted the parent variety in the orchards of that district. The variety is also grown commercially in some of the other states of Brazil.

The first introduction of Navel oranges to this country of which anything is now known occurred about 1838. The late Thomas Hogg of New York published an account in 1388 telling of a wealthy Scotch planter in Brazil who moved to an island in middle or southern Florida, later returning to Brazil to secure a collection of plants. These were sent to Mr. Hogg's nursery at the corner of Broadway and Twenty-third Street, New York and among them were several navel orange trees. After a year in the greenhouse the collection was sent to the owner in Florida. During the Seminole War he was suspected of giving aid to the enemy and the United States troops destroyed all his plants and trees before any of them had fruited and no trace of them now exists. Although it is not known that the navel orange trees in that introduction were of the same variety as those sent in later, such was probably the case.

### Introduced by William Saunders

The introduction of the Washington Navel orange to the United States was made by the late William Saunders then Horticulturist, Landscape Gardener and Superintendent of Gardens and Grounds of the division of the U. S. Patent Office which later developed into the present Department of Agriculture. In 1868 he learned through a lady correspondent then in Bahia, Brazil, that the oranges there were seedless and superior in character to any with which she was familiar in the United States. Thinking that this fruit might be of value in this country, Mr. Saunders requested that a few trees of the variety be sent him. In reply he received a small box o' o range

*(Continued on page 31)*

# The Western Trend In Orcharding

*By Gordon G. Brown*

Hood River Experiment Station

ORCHARDS in the Pacific Northwest have many problems in common with other sections. How to produce maximum crops of best fruit requires study, patience, ingenuity and adaptation to local conditions. The writer, having made a study of fruit growing in this section for many years submits a brief resume of the more important conditions surrounding this industry.

### Soil Management

Management of orchard soils in the Pacific Northwest has undergone a marked evolution during the past ten years. Changes introduced have greatly altered their physical and chemical properties. Maximum or minimum tree growth and production is closely related to soil management in-so-far as good or bad practices prevailed. Typical orchards, representative of either extremes, are readily found.

Virgin soils were found by those who set the trees. That is to say, they were fertile to a marked degree. This was especially so in Wenatchee and Yakima Valleys, typical "sage brush" land. In the heavily timbered lands of Hood River Valley under semi-humid conditions, available plant food for maximum crops was ample. Humus, or decomposed organic matter was fairly abundant. It held the soils open and porous so that good tilth following cultivation was excellent. Rapid disintegration of this natural supply, the accumulation of years, by intensive tillage caused the release of abundant plant food. Trees made rapid growth and after reaching the bearing age produced maximum crops. The prevailing system was clean cultivation year after year.

### A Wasteful Practice

This system was basically wrong; extravagant; wasteful. The underlying principle is now universally recognized. The removal of organic matter without provision for its restoration constitutes the quickest and surest means of soil depletion. Gradually, soils lost good tilth, and responded less rapidly to irrigation because they lacked absorptive power. On hillsides they were subject to erosion.

Many orchards, formerly productive to a marked degree, began to fail. This was true not only of neglected orchards but those apparently receiving the very best care. Tree growth was reduced to negative proportions; fruit spur development was weak; and the ability of spurs to set fruit was subnormal as evidenced by small crops, following heavy blooming.

### Organic Matter and Fertilizers

Since 1915, the use of a quick acting commercial fertilizer such as nitrate of soda, has been very general. Following its use a rapid restoration of orchards followed. The use of from three to five pounds per tree in early Spring resulted in vigorous growth, and large crops. Leaves took on a healthy dark green color and the fruit attained large size. Excessive use of this fertilizer, however, resulted in diminished color in red varieties such as Spitzenberg. At the same time the use of green-manure crops was made. Orchards were seeded down to Alfalfa, Clover or Hairy Vetch. The two latter crops are usually plowed under after a year or so growth. Often vetch is disced under and allowed to reseed itself. Alfalfa when well rooted is thoroughly disced up every Spring for the purpose of renovation, weed control and to incorporate organic matter. Some growers remove some of this crop for hay, usually the first cutting. Some do not cut at all. Many of our best orchards are handled in this way. By so doing, a maximum of organic matter is retained and returned to the soil. Alfalfa has come to stay.

Under improved soil practices such as indicated, orchard fertility has been restored. There seems little danger of overdoing the cover cropping idea. Soils so handled respond readily to cultivation and irrigation. Uniform moisture holding capacity is assured. The Oregon and Washington Experiment Stations are studying the practicability of the supplementary use of commercial fertilizers where shade crops are employed. Results show that it often pays to do so, especially when large crops are in prospect.

Typical Western Spraying Scene. Two guns are working Under High Pressure

Space will not permit further discussion of this subject. Suffice it to say that Western experience teaches lessons having a wide application. Let the grower realize that fruit trees respond readily where soil fertility is maintained at a high standard accompanied by adequate soil moisture.

### Pruning Practices

Pruning is one of the most important phases of orchard management. Much has been learned in recent years regarding best methods and the relation of this work to other operations, such as irrigation and fertilization. Summer pruning has practically been discarded except in special cases, as for instance in the shaping of young, vigorous trees. Unless done very early in the growing season trees are lessened in vitality and possibly made more subject to winter injury in that late growth is induced. It is generally recognized that pruning, if properly done, has for its aims not only the training of a tree, but also the conservation of plant-food. Great differences of opinion still exist among growers regarding the manner in which this shall be performed. Often heavy crops of large size follow extremely heavy pruning. This may follow very heavy thinning and heading. A superficial conclusion may therefore be readily arrived at that this practice has a wide application. On the other hand, there are growers who do not prune heavily but yet secure large yields of first class fruit. Usually light thinning out of the smaller branches is customary. Practically no heading back is done except occasionally to control unruly limbs. This is especially true with Yellow Newtown, Arkansas Black and other varieties making strong lateral growth.

Obviously, both practices are not equally good under any one set of given conditions. It is impossible to generalize safely. Results in the former instance may have been induced largely by pruning whereas in the latter case good fertilization may be the contributing factor. The amount of annual tree growth very largely governs pruning practices. At Wenatchee trees are closely set and grow vigorously, hence the need for severe pruning. At Hood River, trees are set farther apart and growth generally is less vigorous. This results in less severe cutting. Varieties such as Spitzenberg, Winesap, Jonathan, Arkansas Black and other colored sorts, respond well to liberal thinning out so that sunlight may be abundant throughout the tree whereas Newtowns respond well even where shaded conditions exist.

Delicious Apple Tree at Hood River which Produced 40 Loose Boxes Last Season

### Trees Kept Vigorous

Keeping the tree *vigorous* is recognized as the essential factor in successful orcharding. Upon this, is based the development and performance of fruit spurs. Heavy bearing trees must have a large number of spurs which are regular performers. New fruit spurs not only produce the finest fruit, but do so more regularly than old spurs, many of which lack vigor on account of age and an unfavorable location in the tree. Records show that weak old spurs may not produce fruit more often than every five or six years. Furthermore, spurs are being constantly eliminated by excessive shading and by injury from thinners, pickers etc. Were new fruit spurs not rapidly produced, therefore, the grower would depend upon a constantly diminishing number of old spurs of irregular habit.

### "Off" Bearing Overcome

The solution is new growth and plenty of it, especially with trees inclined to "off year" bearing. Although both Spitzenbergs and Newtowns are somewhat naturally inclined to bear irregularly this has been largely overcome. During the "off year" heavy pruning and fertilization is resorted to. This results in much new growth. Old fruit spurs often when thus stimulated make two feet growth or more. What is the result? During the following year (the heavy cropping year) many new spurs are formed on this new growth and are ready to produce fruit during the second year (the normal "off year." A wise combination of pruning and fertilization has induced regularity of bearing and increased yields of fully fifty per cent in many Hood River orchards. This is an established fact.

### Spraying Developments

Spraying under Western conditions is thoroughly standardized. Much progress has been made during the past five years in methods of application, combinations, dilutions and timeliness. This is reflected in higher percentage of Extra Fancy fruit. The most striking feature has been the introduction of the "spray gun" in place of the long cumbersome spray rod. Greater efficiency in the use of labor and material has resulted. In many orchards the three and one-half horse-power sprayer has been replaced by a larger machine, usually ten to fifteen horse-power, capable of furnishing two to three guns with a capacity of approximately twelve to fifteen gallons a minute. Leading Northwestern districts spray very largely according to the "calendar." This is a program covering an entire season's spraying and gives specific information for each insect or disease. This is varied according to seasonal developments. Codling Moth is seriously prevalent in all districts and this year caused heavy losses despite what appeared to be thorough spraying. Other pests and diseases combatted are Leaf Roller, Anthracnose, Mildew, Scab, Brown Aphis and Fruit Worm.

### Experimental Work

That thorough spraying pays is effectively demonstrated but not always recognized. The Hood River Experiment Station has made a thorough test of three important fundamentals.

1. Proper Spraying Equipment.
2. Thoroughness of Application.
3. Proper Timing of Sprays.

The high pressure outfit is best. A two-gun sprayer should have a pump capacity of 12 gallons per minute, at

*(Continued on page 41)*

# Notes of a Horticulturist in Europe

## By U. P. Hedrick

A brief summer journey in Europe began in Liverpool, July 15th and ended in Antwerp, September 8th. About three weeks each were spent in Scotland and England, France, and Italy and a week each in Switzerland, Germany and Belgium. Without attempting to write a connected account of the trip, I am setting down a few of the many interesting impressions an American horticulturist gets in visiting the several fields of horticulture separated from his own by the Atlantic.

Horticultural observations on this visit, began in the beautiful Lake Country of Northwestern England. Here perhaps more than in most places in England one is impressed with the great differences between the climates of Great Britain and America. The modifying influence of the Gulf Stream on the west coast of Europe gives this region a climate so moderate and equable, so different from the extremes of our fitful seasons, that an American, despite his knowledge of the fact and of its causes, is always amazed.

### Mild Climate Attractive

Situated as far north as central Labrador on the Atlantic and nearly in the latitude of southern Alaska, the climate of England and of Scotland as far north as Edinburg is so moderate in winter that plants flourish which Americans never see in their own country outside of greenhouses, the Gulf States, and California. Examples of a few from many are the Sequoias from California, the monkey puzzle tree from Chili, fuchsias, and several hardy palms.

On the other hand, except in favored spots in southern England, the British summer is too cool for peaches, grapes, corn, tomatoes, melons and cucumbers, which Americans grow out of doors far into Canada. Despite, as I have said, our knowledge of these differences in climate, the diversified and healthy and vigorous vegetation, and the beautiful landscapes that arise therefrom, are the most impressive sights to an American horticulturist in Great Britain.

Perhaps other differences, due to the cooler summers and greater humidity in the air, are interesting enough to note. Vegetation, as shown by maturity, is much less hurried than in America. Therefore, the European has a much longer period for all of his fruits and more time in which to harvest his crops—an English fruit grower in summer is a man of leisure as compared to his American fellow worker who is at the mercy of sun and heat and must rush his product to market. Cold storage and refrigerator cars cut almost no figure in British fruit growing; they cut a very large figure on this side of the Atlantic.

### Superior Pears

The perpetual green for which Great Britain is noted is reflected a little too much in some of her fruit products. Apples and pears seldom show the ruddy cheek and bright color, nor so fine a finish, as do the same varieties grown in America. Pear trees, however, grow better in the equable climate of Europe than in America, and since the pear there is not annually subjected to our black plague of blight, it is much more commonly grown in Europe than with us. In apples and peaches, America excels; in the other tree fruits, as against eastern America at least, the palm of merit goes to Europe.

In no part of Europe is the growing of tree fruits for the markets so extensively carried on as in many parts of America. Plantations are on a much smaller scale than with us. The trees usually stand in sod and the orchards are nearly always pastured. Spraying is sadly neglected except in fruit gardens and under glass. Choice fruits sell for enormous prices. Good peaches in England bring from ten to fifty cents each. The European markets offer wonderful opportunities for American peach growers now that quick transportation and refrigeration enable us to ship peaches across the

The canning industry for whole fruits is quite insignificant as compared with ours, but on the other hand we have much to learn from Europeans as to the use of fruits for jams and jellies. Fruit juices are not much in evidence except in the fermented state, the production of which is the chief use to which fruit is put on the continent. Wines, ciders, perries and fruit brandies and liquors use up most of the fruits in Continental Europe.

### Currants and Gooseberries Superb

One misses black raspberries, blackberries and loganberries on the other side of the sea though they are being more and more grown. Red raspberries, currants and gooseberries are more commonly and better grown than with us.

The gooseberry is the fruit of fruits in England and a splendid fruit it is. There are literally hundreds of varieties, the fruits of some of which are as large as small plums. Now that by spraying we can check the gooseberry mildew, this delicious fruit ought to be grown in America for dessert as well as for culinary purposes. The first step toward stimulating gooseberry culture in America is the culture of better varieties than our wretched little Houghton and Downing.

### Strawberry Better Grown

The strawberry is as popular on one side of the Atlantic as the other, but is better grown in Europe, especially in England. We grow none of their varieties, and they have none of ours—not so nearly true of any other fruit common to the two regions. Their berries are not picked, packed and marketed so well as ours, a statement that holds with most other fruits as well as with strawberries.

The garden culture of fruits in Europe is far ahead of that in American gardens. It would take pages if not volumes to tell of the splendid plants and products of European gardens. Under glass, on walls, trained as dwarfs and in the several formal shapes so dear to the hearts of Europeans, peaches, pears, apples, plums and cherries astonish and please an American lover of choice fruits beyond any other horticultural sights to be seen. Products so grown give one a new conception of the term "dessert fruit." "Dessert," by the way, in European homes and eating places, usually, if not always, means fruit, and not sweets and ices as with us. Most of the fruit so grown, I think, is used by the owner of the garden, but much of it finds its way to city markets at what to us would be fabulous prices. Would that our well-to-do people took to gardening more and knew and loved better good fruits!

### National Fruit of France

The pear was of particular interest in France. This fruit has been so largely improved and is so commonly and well grown that it may well be called the national fruit of France, although the acreage of grapes for wine is, of course, much greater. The artificial training of the pear-tree is here carried so far that the pear-grower is as much an architect as a gardener. One may see the pear trained to many espalier forms, or as vases, globes, spirals, pyramids, to weep, and to many other shapes in all of which great trouble is taken to get each plant perfectly symmetrical. The work given one plant would almost in some cases equal that given an acre of trees in New York.

### Nurseries are Excellent

European nurseries are a pleasure and a delight to an American. Labor is cheap, abundant, skilled and honest so that most of the nurseries are perfectly kept. Every tree is a good tree. Poor specimens are discarded. An American marvels at European skill in propagating and training plants. Each individual seems to have had detailed attention. Trees trained for walls, fences, trellises in various shapes, and the great number of dwarf forms excite one's interest and wonder.

The nurserymen are scarcely less remarkable than their nurseries. Growers of nursery stock in America, as a rule, know only tree-growing and give no attention to fruit-growing and seldom know the product of their trees even by sight. Not so with the average European nurserymen—usually he is a very good pomologist as well and very often a grower of good fruits. To a man, European nurserymen are up in arms over America's plant quarantine, and join in the European protest against America's selfish policy in keeping out of the League of Nations, building a protective tariff wall, and in shutting out European plants.

### Vineyards of Interest

European vineyards are of especial interest to an eastern American horticulturist. There are few or no wire trellises as in America. The trunks are stumps about a foot above ground. From two to four arms surmount the trunk, and these, in turn, bear from two to four shoots which produce from one to three bunches of grapes. The vines are usually tied to slender stakes with grass or straw, and are so diminutive, as compared with ours, that from a distance a vineyard looks like a plantation of tomatoes. The plants are only three or four feet apart and are cultivated by hand. Often the vineyards are on hillsides so steep that the land is walled and terraced to prevent the soil from washing away. These remarks apply to the grape as grown in France and Central Europe; in Italy, the vines seem to run riot over trees planted in rows to serve as stakes, their luxuriant growth curtailed, seemingly, but little by the hand of man.

An American sees much more of interest than I am able to mention in these brief notes. The nut plantations are suggestive to us who do so little with nuts. After a visit to the olive groves of France and Italy, one gains a new respect for the truly wonderful olive, trees of which are said to be several hundreds of years of age. Northern Italy is thickly set with mulberry trees to support the great silk industry of the region. Lindens are much used in parts of Europe to give shade and to furnish the honey-bee with food. Grapes are grown under glass in thousands of homes in Belgium for exportation as far even as our own country. European parks and botanic gardens furnish splendid opportunities for botanists and horticulturists to study. Nurseries and plantations of ornamentals are everywhere more common in Europe than with us. Public markets in which the products of European orchards and gardens are sold are far more common than in America and are a great asset to these industries. But of these and many other interesting things, there is not space to comment.

# Mr. Apple Grower, Mind Your Own Business!

## By C. F. Massey

APPLE growing as a commercial undertaking is one of the most highly specialized forms of agriculture, and when conducted as such in favorable districts is one of the most profitable. Note well that qualification: "When conducted as such," for the temptation to be led astray into diversified farm crops in connection with apple growing, is beguiling indeed.

### One Crop Bogey

The one-crop farmer has always been a sort of bogeyman held up before the disciples of Ceres as a discouraging example of singleness of mind and action as applied to farming of any kind or character. Soil impoverishment, dwindling yields, persistent weeds, and an avalanche of pests, bugs, and diseases, are all threatened to the one-crop farmer as inevitable tragedies that ensure his utter loss of morale and speedy financial collapse.

By all means let us rotate our field crops, but our orchards are planted once for a lifetime and require undivided study and care to secure the profitable yields they are capable of producing. Every hour of intelligent effort spent for this purpose pays mighty big dividends and these possible dividends are so much larger than those from any average field crop that no commercial apple grower has any business fooling with side line crops after his trees reach bearing age.

As an easy proposition it is often accepted that the farmer, be he apple grower or what-not, should produce more than one kind of a crop; that diversification distributes labor and keeps it busy from spring until fall. There is also the siren appeal for playing safe; a variety of crops would hardly all fail at once, nor is it likely they would all be down in price the same season. Shall the apple grower then plant a number of crops in the hope that one at least will be bountiful and bring him a profit?

### Diversification Dangers

With all sincere respect and admiration for the general farmer, a diversified crop system for the commercial apple grower is fraught with danger and pitfalls. And the reason is this: there is not a single field crop of more than a very few acres indeed, that does not interfere seriously from its planting to the harvesting thereof with some one essential orchard operation. The huge bulk of cull apples in every orchard district bear distressing witness to this fact, and the enormous cider and vinegar plants over the country are veritable monuments to inefficient orchard operations. No apple grower can do timely or thorough spraying when harassed by the realization that his corn is demanding cultivation, or that his wheat is full ripe, or that the haymaking season is upon him.

### Too Many Culls

What is the result? Let the trees and the cull pile tell. The spraying is rushed through so that attention can be given to the suffering crops. The tying of weak branches or the propping of overloaded limbs is neglected to minister unto some grain crop or other that at best hardly pays its own expenses. The worming of the trees, or the careful summer thinning or trimming that can add so much to the quality of the fruit, is given a lick and a promise—if done at all—so that a $20.00 to $30.00 per acre field crop, frequently grown on $200.00 to $300.00 per acre land, may be harvested high, dry, and handsome, without delay.

Every workable day from early spring until late fall should be a busy

(Continued on page 88)

# Some Hints on Grafting

*By W. Paddock*
Ohio State University

IT IS likely that but few of the many "tricks of the trade" afford the amateur more satisfaction, and at times the professional fruit grower greater profit, than the art of grafting. The early Roman writers on agriculture, dating from several centuries B. C., mention both grafting and budding, and of course the principles upon which the arts are founded have not changed during the centuries. But in spite of age and simplicity but comparatively few people appear to understand how to make a graft.

If one is to prepare for the grafting season which will soon be upon us the first consideration should be the cion. Cion is the name given to a twig which is taken from a tree of a variety we wish to use in working over another tree, called the stock. The cions are always cut from the firmer portion of the previous season's growth. This is for the reason that the last growth that grew is the only part of the tree that has buds upon it, consequently older branches will usually prove worthless. The ends of these twigs will often be immature and if so they should be cut back to firm wood.

### Must Be Dormant

It is always better to have cions that are dormant and with the stone fruits this is absolutely essential. For this reason it is a good plan to cut the cions in the dead of winter when we may be sure that the buds have not begun to swell. They then may be tied in bundles and packed in damp moss or sand and stored in a cold cellar or they may be buried in a dry location where they should be given just enough covering to keep them from freezing.

The stock, being a growing tree, of course needs no preparation, but this brings us to the time of year for grafting. As has been stated, the cions of stone fruits must be dormant, so too it is essential that the stock be in the same condition. Centuries of experience have shown that late winter or early spring just before growth begins is the best season for grafting.

In making this statement as well as that the cions and stock should be dormant we are not unmindful of the fact that a recent writer claims to have been successful in grafting even the nut trees, which are notoriously difficult to propagate, during the heat of summer. The only new feature introduced by this experimenter is that of completely covering the cion and the cleft and the cut end of the stock with melted paraffine. No doubt fruit trees will respond equally well to this treatment and if so this knowledge will be of no small benefit.

Young apple tree that has been recently topworked. Note that cuts, scions and wax are all visible.

### A Good Wax

Grafting wax is made by boiling together two pounds of beeswax, one pound of tallow and four pounds of resin. When all of the ingredients are melted the mass is poured into a vessel of cold water and when cool enough it is pulled and worked as though it was a batch of molasses candy. When the wax takes on a light straw color it is finished and will keep indefinitely.

Usually one must confine his grafting within the species, that is, graft apple upon apple and pear upon pear, though there are some variations to this rule. For instance, the pear will unite with the quince, and the seedlings of the peach, plum, and apricot are sometimes used interchangeably in budding these fruits. The apple will often unite with the pear or the crab apple but the union is often short lived and not satisfactory commercially.

Trees of any age may be grafted but the topworking of younger trees is the most practical. The special feature to remember in topworking older trees is not to attempt to graft limbs that are too large. A limb three inches in diameter is about as large as should be attempted and two and two and a half inches will be found to be the more practical sizes. This being true it will be seen that it is scarcely practical to work over large trees as this would cause the fruit to be produced too high above the ground.

The cleft graft is used most commonly in topworking and no doubt is as easy as any to make. The selected limb is sawed off at right angles to its direction of growth and preferably leaving a stub about a foot long. The stub is next split across its center with the aid of a grafting chisel, and making an opening or cleft a little wider than the diameter of the cion. The cion is then cut with a very sharp knife about five inches long and the lower end is fashioned to a wedge shape which should be about an inch and a half long. One edge of the wedge should be a trifle wider than the other and it is customary to so manage that a bud will be located at the top of the wedge and on the wider side. The cion is now fitted into the cleft with the wider edge of the cion on the outside and it must be so nicely placed that the narrow growing region between the bark and wood of the cion comes directly in contact with the same region of the stock. If this nice adjustment of the cion is missed the graft will be a failure as this is the only part of the limb where a union of the cion with the stock can take place. We should have mentioned that the cleft must be held open while the cions are being inserted with a wedge

(*Continued on page 46*)

# Sense and Sex in Strawberry Names

*By A. B. Cutting*

"WHAT'S in a name?" To paraphrase the Bard of Avon, "that which we call a *strawberry* by any other name would *taste* as sweet." But names within names often have deep significance. Some names of plants and animals that seem even ludicrous in application have meanings all their own. Imagine calling such a mighty masculine thing as a Shorthorn bull, "Missie"! Yet it is done—and with deep significance, "Missie" being the name of one of the families of the breed. Imagine calling the fleur-de-lis, the beautiful plant emblem of France, "Iris Germanica"—especially since the war! Yet that is its generic name *a la* Linnaeus. And imagine naming a male (staminate) variety of strawberry, "Mrs. Mark Hanna," and a female (pistallate) variety, "Mark Hanna"! Yet it was done—without significance and without discretion. Since the first new variety of fruit, whether strawberry, grape or what-not, was discovered and improved from the wild, varietal names have been selected and applied mostly without regard to either significance or the future. In the strawberry alone, hundreds of varieties have been named without regard to sex or sense. Taking the term "male" to designate varieties that are self-fertile as opposed to varieties that are distinctly female, the panel on this page groups some of the names of strawberries as we find them.

For the benefit of both plant breeder and practical grower, new originations in strawberry varieties should be named in accordance with the sex of their blossoms. Some ten years ago, the writer first made this suggestion at a meeting of the Pomological and Fruit Growing Society of the Province of Quebec. Many favorable comments afterwards were received from prominent horticulturists of the United States. Dr. L. H. Bailey, Cornell University, wrote: "The naming of new varieties of strawberries in such a way that the names indicate the sex is new to me, but I like it." Mr. W. M. Hays, then secretary, American Breeders' Association: "The suggestion seems very practical." Prof. J. C. Whitten, then of Missouri College of Agriculture: "I think the idea an excellent one. The only wonder to me is that somebody had not thought of it before. The idea is certainly worth being pushed horticulturally. As some of our other fruits also are proving to be self-sterile, the same idea might in future, perhaps, be carried out in other self-sterile groups." The late Prof. S. A. Beach, of Iowa State College: "If the plan were universally followed, it would be something of a guide to prospective planters with regard to the character of the blossoms of the varieties from which they were making selections for planting."

The suggestion is just as practicable today as it was ten years ago, or at any time since the genesis of plant improvement and naming. It is even more feasible, because new varieties in strawberries with names inappropriate to sex are constantly being added to the list. While it might not be practicable to alter the names of existing varieties, it would mean much to the growers of the future if all new originations and discoveries in varieties with perfect flowers were given male names, and those with imperfect flowers, female names. As the tendency of strawberry growers favors the planting of staminate varieties and as, in consequence, this type will always predominate, even neuter names could be given to staminate varieties—provided that pistillate sorts were given names that were distinctly female. (While one probably should use the words "masculine" and feminine" for accuracy in references to names, and the term "hermaphrodite," "bi-sexual" or "perfect" instead of "male" or "staminate" for blossoms of this class, the terms "male" and "female" are used in this article to indicate most effectively sex in both names and types). By the time that new varieties are determined worthy of propagation and dissemination, the sexes of the blossoms will be known. Until that time, naming might well be left in abeyance. Varieties that are then worthy of cultivation should be worthy of names that mean something.

When strawberry plants bloom in the field it is an easy matter to determine the sex of the blossoms. It should be just as easy to determine the sex of varieties in advance by their names. At present, we have male varieties with female names, female varieties with male names, males with male names, females with female names, and each class with neutral names. Names that now indicate the sex are largely the result of accident.

Had all varieties of strawberries been named definitely in accordance with sex, say, starting fifty years ago or before, this generation would accept the custom as natural and necessary. Outside of Longworth (originated in 1848) and Triomphe (1855), both still grown on the Pacific coast,

(*Continued on page 45*)

# Editorial Problems of the Day

SAMUEL ADAMS

C. I. LEWIS

## Too Much Haste

TOO much haste in changing from one type of fruit growing to another and too much haste in changing varieties is often resorted to. Conclusions drawn on one year's experience are dangerous. If over an extended period a grower or a community find that certain varieties of fruits are unprofitable, they are warranted in changing. A man well versed in California conditions recently told us that he had yet to find a single case where he thought a grower greatly improved his condition by working over his varieties. There may be in some sections too many early apples, a hot season may demonstrate that there are too many Jonathans or Grimes in another district, but may there not be other solutions relating to distribution, storage and marketing which have a bearing on this subject? Is it not possible that if large groups of growers change varieties that soon after the new varieties come into bearing they may be facing the same condition they have been running away from? Wholesale changing of varieties is rarely profitable. Fifteen years ago we thought we did not have enough late summer and early fall apples. Everyone planted. Now many who planted the early varieties are planning to graft over to mid-winter varieties. Will we not in ten years from now face another unbalanced production?

## Car Shortage

EVIDENTLY it is going to be impossible for our railroads to overcome the car shortage for some years to come. With only about 113,000 cars it is going to be practically impossible to handle nearly a million cars of perishables annually. Not only that, but some rapid changes and developments have taken place in the fruit industry in the past few years. Take the grape industry of the Pacific Coast. A few years ago they were shipping only a few thousand cars. This year probably 50,000 cars of grapes were produced on the Pacific slopes alone. In addition to this, an ever increasing tonnage of Concords is being produced in the east. These grapes need refrigerator cars. They are using cars which formally were devoted to the handling of other deciduous or citrus fruits. New cars are not being built rapidly enough to prevent deterioration of present tonnage and at the same time handle the increasing tonnage. The best of the situation will have to be made for the time being but it behooves every community to look into the question of common and cold storage.

Only about 25 per cent of our apples in this country can be accommodated in cold storage today. This percentage should be greatly increased. Facilities should also be secured for the pre-cooling and storage of other deciduous fruits, such as pears, peaches, plums and cherries. A terrific loss was experienced by some of the fruit growers this past year because it was impossible to get cars soon enough to prevent the deterioration and decay of the fruit. By having better cold storage facilities such fruit can often be held for weeks until rolling stock can be secured. Bankers, business men, fruit growers, shippers and receivers all should have a keen interest in this question and should exert every energy they possess to help solve it.

## The New Year

AT THE beginning of a new year it is the time to take an account of stock, it is the time to take an inventory. An orchardist has considerable time between now and spring when he should analyze his methods—he should analyze carefully the returns he is obtaining from his orchard. What are your returns as regards yield and quality of the fruit you produce? Are there certain reasons why you are not doing better? Is your neighbor across the way getting better results? His results perhaps are not due entirely to the fact that he may possibly have better soil or a better location; but are his methods perhaps somewhat different? Are there trees in your orchard which are unproductive? Are there whole blocks of trees which never have been productive and possibly never will be unless you radically change your methods? Have you some neighbors in your community that are securing unusually good results but practice somewhat different methods than you do? If so, might it not pay to analyze their methods very carefully and see whether or not they might not apply to your orchard? We know of an orchardist who was producing only a bushel of apples per tree per year. A little careful study of some of his neighbor's practices showed him that by slightly changing his orchard management he could easily boost up the average returns of his trees to a yield of ten bushels per tree.

After you have analyzed your own situation individually, what is the general condition of fruit growers collectively in your community? Is the community prosperous? Is it going ahead? Is the future of fruit growing bright? If it is not, why not? Are the growers in your community organized and if so, are they strongly organized? What are the opportunities in your community for getting better storage and shipping and packing facilities?. What are the opportunities to strengthen your position and that of your association by working together in closer harmony?

These are some of the inventories which you need to take at this season of the year.

## The Tide Has Turned

NEARLY every financial report that is sent out shows that the tide has turned and business is getting better. Recently the Secretary of Agriculture showed that the farmers of the United States will get two billion dollars more for their products this year than in 1921; but perhaps one of the best indexes of conditions in the country at large is the report of the mail order houses. The recent report of Montgomery Ward & Co., is intensely interesting. The sales of such an organization are made very largely in the country and in relatively small cities. The business done by this concern in the past year aggregated $92,474,182 as compared to $75,956,649 for 1921, or an increase of 21.75 per cent, which amounts in dollars to $16,500,000.

Perhaps the most interesting thing, however, concerning the report is the large increase during the last three months of 1922 compared with the last three months of 1921. October showed an increase of over 35 per cent over October 1921; November over 45 per cent increase over November 1921, while December showed an increase of over 56 per cent as compared to December 1921, showing that the marked increase took place during the last three months.

Reports coming from men prominent in finances today, reports from business agencies all indicate that 1923 will be a much better year in business than was 1922.

## Crop Insurance

SPRAYING and dusting are a form of crop insurance. For most insects and diseases they should be used as a form of prevention rather than a cure. After an apple once becomes badly covered with scab, it is not worth trying to keep more scab off. The apple has practically become a loss—it is a cull. After a worm once enters the apple it is too late to spray for worms—the apple is a total loss.

Spraying and dusting will pay big dividends. To get the best results growers should adopt a definite schedule and stick to it. They should be prepared at all times for the unexpected. There will be no unusual seasons as far as damage is concerned if the growers will always follow a carefully planned schedule, such as is frequently recommended in this issue.

## More Co-operation

THERE is a big opportunity in this country for such distributing organizations as the Western Fruit Jobbers, Fruit and Vegetable Shippers, National League of Commission Men and the International Apple Shippers on the one hand and producers on the other hand, especially those organized in big groups, to co-operate to bring about much better conditions in the merchandising of fruit, to bring about better packing and grading, better transportation, better storage, better distribution, better advertising and better consumption.

In industry in general during years of great supply, there is a tendency for all concerned to exert every effort to move the merchandise. In the sale of our fruit, however, we often find that in years of big tonnage there is a tendency for the man at the receiving end to sit and wait. He figures he does not need to buy f. o. b., that plenty of tonnage will roll to him on a consignment basis. The grower is dissatisfied with this attitude and at first holds off, only later to ship large quantities of fruit, especially into the big centers. This policy does not tend to produce a healthy market condition, does not tend to increase consumption and is something which can be, to a certain extent, corrected by proper co-operation. The problems of marketing are so large that the aid of all concerned is needed if much progress is to be made.

# In the Orchard in Spring

*By C. I. Lewis*

SPRING will soon be upon us with its rush of work. It is a time of great activity, of great hopes and anticipations. Before the tremendous rush of spraying, pruning, tillage and setting of new trees is upon us, it is perhaps well first to analyze our work and see whether or not there are any changes which we can make which will better our conditions.

In those orchards which are tilled, this operation comes in for the most serious consideration at this time of year. Everything being equal, the earlier we can till our orchards the better. We will avoid congestion of our work and we will conserve moisture which we may need later. This is especially true in those districts which are subject to more or less periods of drought from spring to summer. Where soils are rather light in character, it is very essential that the tillage be given early. With many of these soils disking may take the place of plowing, the latter practice being resorted to only once every few years. Disking is much cheaper than plowing and often will bring about just as good results. Where soils are heavy and contain a great deal of clay, plowing will be necessary. With such soils one should avoid plowing large areas, however, and leaving them, for if bright sunshiny days occur or if a period of rain follows closely on the plowing, it will be difficult to get the ground in good condition. Plowing should be followed very soon with a scratch harrow of some kind which will break up the clogs. The disking can take place later. With heavy soils probably some of the best tools to use in the final preparation are the clod masher or the corrugated roller, sometimes known as brillion. When soils once become lumpy, the best time to attack these lumps is soon after a shower or a light rain. They will crumble and go to pieces quite easily at that time.

If an orchard has not been plowed for a number of years, it is a mistake to go in and practice deep plowing. This results in root pruning, which may set the trees back many years.

The growing of cover crops complicates the plowing problem somewhat. We believe a good rule to follow, however, is to plow the orchard at the time you would normally do so rather than to wait for an excessive growth of cover crops. We have seen orchards injured by allowing the cover crops to remain too long before turning them under. This is especially true during periods of protracted drought, which will occur in many districts. Where the cover crop has become rank, as is true in some parts of the United States, it may be disked before plowing, or in the plowing, chain drags can be used which will help pull the cover crop down and will facilitate the turning under.

Where alfalfa is being grown in the orchard, it is well to disk it lightly in the spring of the year. This cuts up the crown causing the plants to stool better, it reduces the fire hazard and is one of the means of killing out weeds and grass. The disking will also work a little fibre in the soil, which will help it to hold moisture.

We want to urge upon all growers, however, having rolling, hilly land, or having very light soils, the great importance of early tillage. It has been demonstrated over and over again that it is one of the best paying propositions in the entire orchard practice. Many an orchardist has lost his season's moisture supply because he put off tillage too late.

### Pruning Hints

We are asked as to how late one can prune in the spring. Some growers practice pruning up to the blossoming period. We have known of pear growers who felt they got very good results with such varieties as Anjou by pruning them while they were in full blossom. The bulk of our pruning, however, had better be done as early as we can conveniently do it before the growth becomes very pronounced. It would be a mistake to delay grape pruning too late as after the sap starts flowing the vines will bleed very badly if pruned at that time. Sweet cherries are sometimes not pruned at all in the spring but the pruning is delayed until after the crop is picked, in July. Some peach growers in sections where frosts are very prevalent wait until the blossoming period and the set are over

Phoma spot on Jonathan.

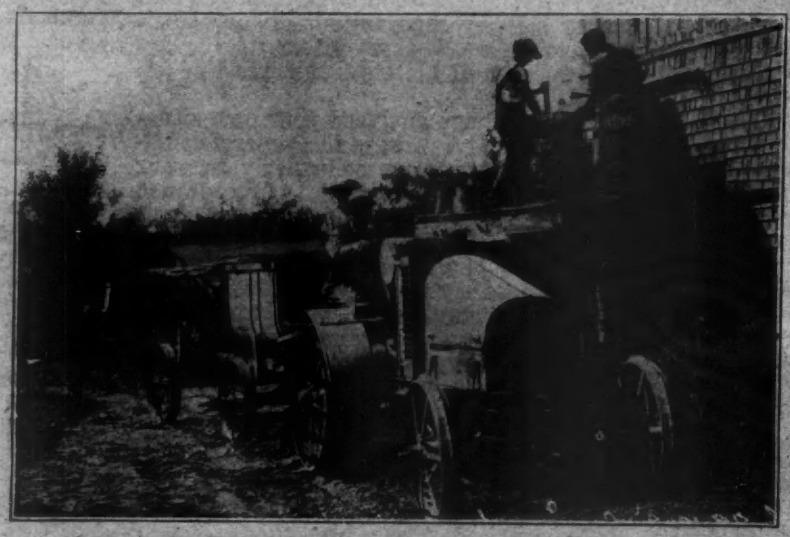
before determining the severity of their pruning. If their crop is exceedingly light and scattered, little pruning is carried on, but if the crop is heavy, quite vigerous pruning can be resorted to.

If you have old pear trees just covered with masses of old spurs, try thinning out some of these spurs. Take a stepladder and hand shears and remove a fourth to a half of these old spurs and watch the result. The remaining spurs will be revitalized, new wood growth will start for the building up of new spur areas, and the fruit will be larger and better than it has been for years.

### Pruning Young Trees

Everything else being equal, probably the less one prunes trees the first ten years of their age the larger these trees will be and the more fruit they will bear at ten years of age. Various experiment stations have demonstrated this fact in the past ten years. Since this is true, however, one concludes often that no pruning should be given trees, and this is a sad mistake. You had better give the trees a little corrective and moderate pruning, rather than to let them go to the point where they become mature trees badly shaped, having large branches which ultimately must be removed. In heading young trees, there are three types of heads which you must keep in mind, the open or vase shaped heading, in which the trees are headed low and the branches all come out at one point; the leader type of heading, in which one branch is always allowed to have the ascendency and the other branches largely become lateral, and third, the modified leader. The modified leader, first brought out in Oregon, is simply a combination of the leader and the open tree, the aim being solely to get a wide spread of branches so as to avoid the weakness of the open tree and still give the advantages of low head and broad spread. The ideal modified leader tree is one that will have from five to nine main branches, all other branches becoming lateral. It was not the intention of the people who first brought out the modified leader to have double deck and triple deck trees. The first work on this was done by the author of this article while still connected with the Oregon Agricultural College. As soon as good spacing of the branches can be obtained, then the leader can be suppressed and the tree is treated from then on as an open tree.

In pruning young trees there are three or four points to keep in mind. Whether the tree be open, a leader tree or a modified leader, avoid too many leading branches. Limit the number of leading branches and build up good strong laterals on these. You will be very glad of that in later years. It gives you a chance to renew the trees much easier than otherwise would be true and it keeps the bearing surface down and keeps the spurs alive longer on the main branches. Keep in mind the first year or two a wide spacing of the branches. Do not allow one branch to run away with the tree and make it one-sided. This can always be easily obviated by simply pruning the branch which tends to become the largest the more. By reducing its leaf surface you reduce the proportion of food and moisture which it receives and this will check its growth to a certain extent, giving the remaining branches a larger proportion of moisture and food and you can very easily bring back a balance of your tree. Avoid equal cutting wherever two branches come together because it always results in a crotch of equal strength which will mean a weak crotch in the tree and which will result in breakage in later years. Always cut so that one branch is slightly longer than the other. This will force the shorter branch to become a lateral and the longer branch will become a sort of leader.



Tractor drawn power sprayers are in general use in the vicinity of Sturgeon Bay, Wis.

In pruning bearing trees, we would urge that they be pruned annually, that the pruning be light and well distributed, that excessive pruning be constantly avoided. It must be remembered that the stimulus comes nearest the cut and by having a great many cuts spread over the tree, the stimulus is spread to all parts of the tree, which avoids strong water sprout growth and the trees are kept in a good balance. Even as the tree becomes mature, one can still practice corrective pruning by suppressing those portions of the tree which are becoming too prominent by simply giving a little more pruning in those areas.

### Applying Fertilizer

The greatest need in most of our orchards is nitrogen. In some cases superphosphate and potash bring good results but nitrogen is seemingly necessary in all fruit soils. The best time to apply nitrogen, like nitrate of soda and sulphate of ammonia, seems to be in the early spring, about a month before the trees start into active growth, or we might say a month before they bloom. This can sometimes be determined by applying the fertilizer just as soon as the scales on the buds begin to spread and show a little color in between. Three to five pounds of nitrate of soda or sulphate of ammonia applied at that time is in a great many cases giving remarkable results. This can be also supplemented by applications of manure and the use of cover crops. The result of the application of early nitrate seems to first affect the blossoms, gives a much larger percentage of set, the leaves come out larger and greener, the twig growth is stronger and better, the buds and spurs on the trees are strengthened, the fruit perhaps matures a little later and in some cases one must avoid this late maturity by not applying too heavy an amount of rich nitrogenous fertilizer. An excess would also result in low color but large sized fruit. Where moderate amounts are used, however, these factors need to be rarely considered.

The question might be asked, "why does the nitrogen give such splendid results on spring application?" The principal reason seems to be that the average nitrogen content in the soil in the spring of the year is extremely low, in fact, the lowest in the entire year. The nitrogen content gets heavier as the season progresses. While some nitrogen, like starches and sugars or carbohydrate are also stored in the wood of the tree, nevertheless there is not enough stored there to give the trees the proper balance. The addition of a small amount of highly concentrated nitrogen gives the trees the proper balance of nitrogen and carbohydrate and results in the benefits we have enumerated above. Nitrogen put on after the trees bloom does not produce immediate results as it does before the blooming. Such nitrogen may be of some value to the trees but it may result more in next year's crop than in this year's.

Trees which have gone through a hard winter or trees like red cherry which have been defoliated by leaf spot, should be treated with rich nitrogenous fertilizer to try and get these trees back to bearing condition once more.

(Continued on page 30)

# Orchard Heating

(Continued from page 4)

...f oil to use for orchard heating, and ...e feel now that it is more economical ...o use some of the lighter grades of ...hat is known as the distillate oils. ...However some light fuel oils may be ...ed satisfactorily. The heavy fuel ...il is not being used in this valley to ...ny great extent at this time. It is ...ery difficult to handle this fuel oil ...nd it does not burn up thoroughly in ...he pots, always leaving a large ...mount of residuum that is very ob...ectionable.

The oils now used in the Rogue River Valley usually cost the grower from five and a half to eight cents per gallon delivered.

**Orchard Thermometers**

One of the greatest mistakes that orchardists have made in the past is to rely upon poor thermometers. Through the cooperation of the Weather Bureau we have worked out a system of thermometer shelters that is recommended to the grower. We have found that thermometers used in a haphazard way by just hanging in any convenient place in the orchard is not at all satisfactory. A small shelter is recommended for each thermometer. These shelters are not expensive and all we care for is some kind of a shelter that will have a board cover and possibly one side boarded to prevent the wind blowing directly on the thermometer.

A new thermometer will be supplied to the growers this season that will register correctly between 20 and 40° with a very wide scale that may be read very easily. These thermometers will cost the growers about $1.50 apiece.

**Cooperation with the Weather Bureau**

For the past 7 years the United States Weather Bureau has been cooperating with the County Agent in the frost work of this valley. Mr. Floyd D. Young spends about two months in the valley each season. Forecasting is one of the principal pieces of work that Mr. Young is detailed to do. Forecasts are made each evening about 6 o'clock as to the minimum temperature during that night. Special weather shelters and instruments are provided by Mr. Young and we have placed them in sections where we can have a check on the heated and nonheated areas. Thirteen of this type were established in the valley last season. Records are kept o' the actual temperatures outside of the heated areas and also within the heated areas. A good deal of information has been accumulated during the past 5 years and a detailed account of all this work will be published in the near future by Mr. Young and the writer.

## Fruit Trees Around Your Home

By George Belknap

From every standpoint there is nothing better to beautify the grounds around a home than fruit trees.

They give an old-homey effect that cannot be equaled by the strictly shade trees generally planted. If you live in the crowded city, go into the country and sit under an old apple tree, in the spring, the tree white with fragrant blossoms, in the summer, the tree loaded down with fruit, or in the fall, among the fallen golden leaves, and you will get my meaning.

Memories of childhood will come flocking back. You will close your eyes and be again a child. Somehow, an apple tree always seemed friendly. Maybe it is because those low hanging branches invited a climb when I wasn't big enough to reach the first branch of the others.

Or maybe some other tree brings back pleasant memories to you. Plant that tree and you will dream many an hour under it. It might have been a peach, cherry, pear, or some other tree that you used to play under, but that tree should find a place on you grounds.

Then, in the summer when your shade trees are covering your lawn with seed pods, the fruit trees are keeping down the family living expenses.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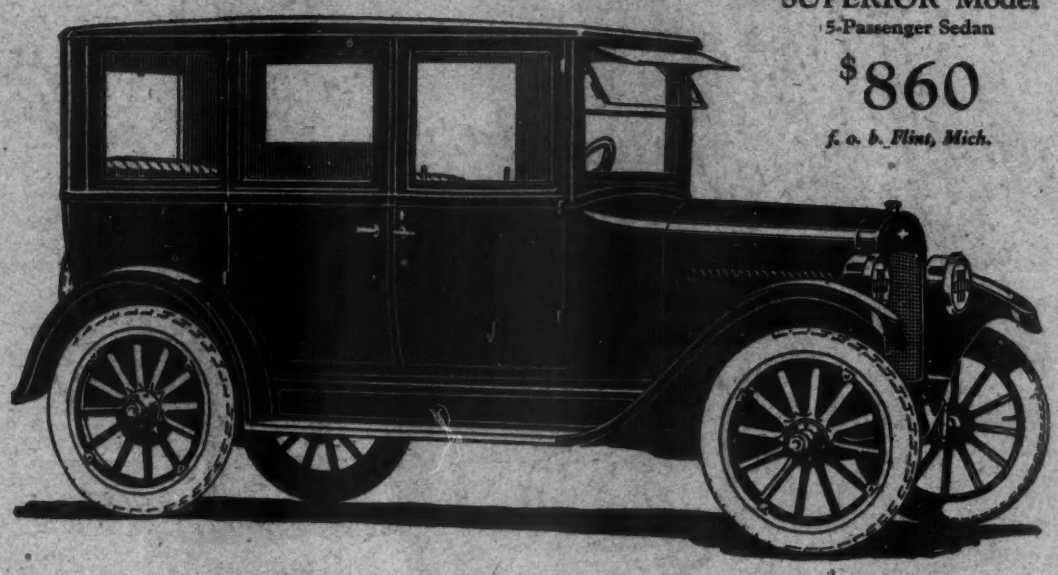

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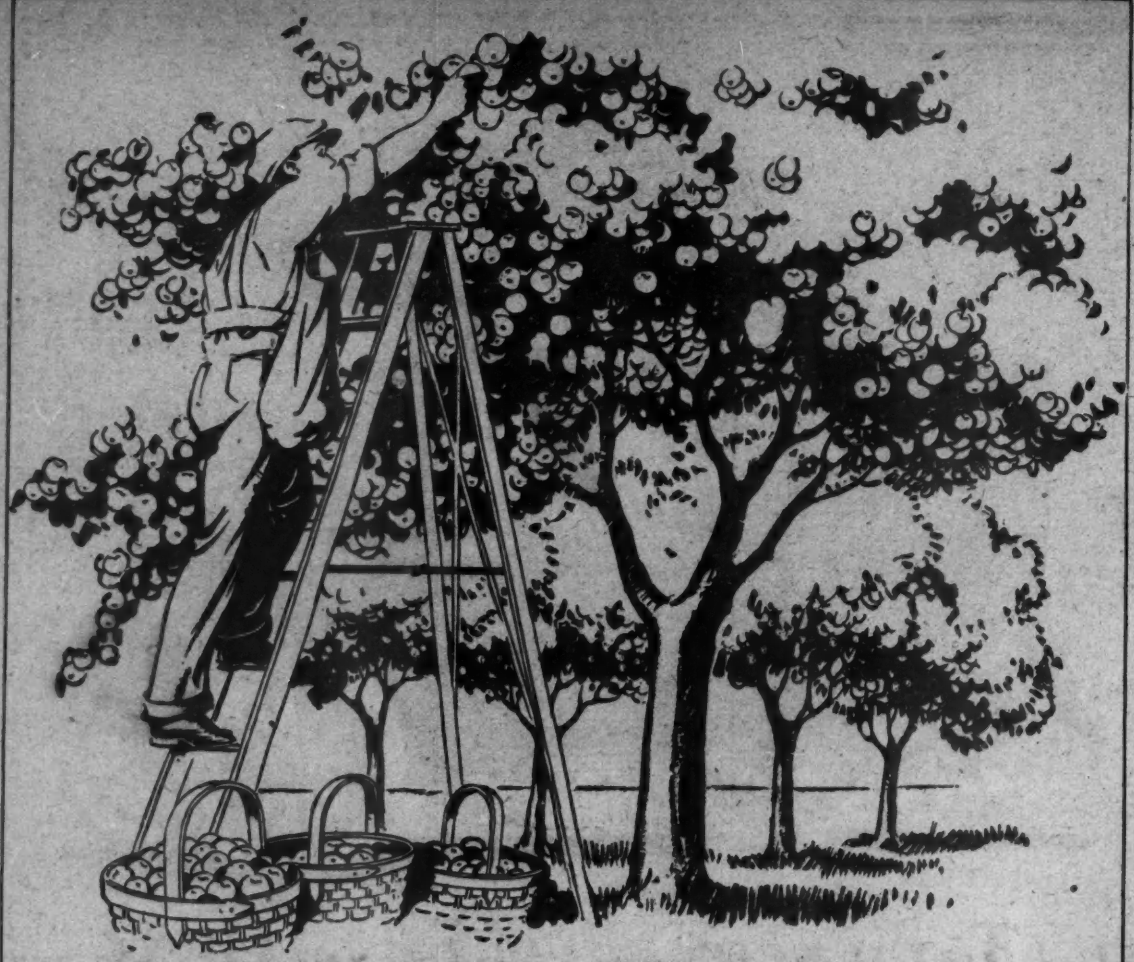

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| Buffalo, N. Y. | Denver, Colo. | Kansas City, Mo. | Portland, Ore. | Seattle, Wash. | St. Louis, Mo. |
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Blast your tree-holes with

NON-HEADACHE DU PONT NON-FREEZING

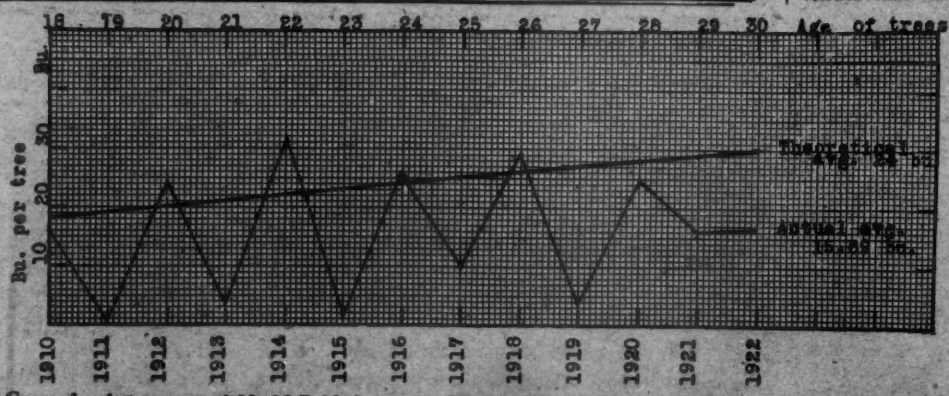
DUMORITE


## Baldwin Losing Ground?

(*Continued from page 5*)

the latter winter and the accompanying curve shows that in two of these bearing years the yield has dropped off, but the off year on the other hand has been the best in the 13 years in which careful records have been kept. The graph also shows the biennial habit of the variety.

Growers would vary considerably in giving an estimate of the number of barrels of apples that might be expected *as an average* from an orchard of mature Baldwin trees. The high yields in the bearing year will usually deceive one as to the actual average over a period of years. I have usually considered 75 to 100 barrels per acre to be an average for Baldwin orchards in most sections, that is, 5 to 9 barrels per tree in the bearing year which, with the occasional poor-yielding trees through the orchard, would give some such average as the above. It is, of course, not uncommon to find orchards that will more than double this figure for a period of years, and individual trees will produce 20 and even 30 barrels in a single season. The average is admittedly too low.




Curve showing average yield of 6 Baldwin trees at Wooster, Ohio. Bushels are indicated on left margin, age at top, and year when each yield occurred at the bottom. The average yield during this period is at the rate of 183 barrels per acre. For further explanation of graph see text.

The straight line in the graph would represent the yield of the trees if they had borne a bushel of apples for each year of their age, (a high standard to set), or an average of ½ bushels per tree per year. The actual average was 15.69 bushels or 183 barrels per acre. There are some varieties that do better but a great many that will not begin to yield that well, and the trees are apparently in condition to continue a good performance record for many years to come despite the drop-off in 1922 when spring frost conditions were serious.

In a neighboring orchard the Baldwin is doing exceptionally well, outyielding every variety except Grimes. This season a row of 10 Baldwin trees impressed me with their vigor and crop. They are now 11 years old and averaged 22.8 bushels per tree and began bearing heavy crops when 9 years of age.

A Baldwin orchard in New England that was under the writer's supervision for a period of 8 years is an illustration of the crop yields of this variety in an orchard which had been unmistakably injured from cold on several occasions. A section of the orchard which received annual tillage but no fertilizers or manures gave an annual yield of 78 barrels per acre for a period of ten years at the end of which time the trees were 35 years old. Five of the ten years the crop was a partial or complete failure owing to frosts or lack of bloom, mostly the former.

These few figures are cited from many that might be offered, as part of the evidence to consider in determining whether or not planting of the variety should be discontinued.

**How Might a Variety Run Out?**

If serious consideration must be given to the running-out of a variety it may well be asked by what biological procedure it is accomplished. Perhaps more is heard of the running-out of potatoes than other important economic plants and many farmers believe they must change seed stock frequently for that reason. Close observation and experience, however, would indicate that most of this "running out" is due to disease infections, whether they be fungi or the more mystericus or subtle mosaics. If the variety is removed to an environment free from the disease or if preventive measures are used to control the trouble the variety will continue in good condition for relatively long periods of time.

With fruit, a case in point is the Bartlett pear. In many sections it might be classed as "run out" when as a matter of fact, the blight has driven it out. If the variety is grown in a section where blight is not prevalent or where disease is vigorously combated, the variety is as healthy and fruitful as ever.

It would seem that the same would apply to varieties that are liable to injury by cold. Because a variety is tender and hence suffers periodically does not prove that it is running out, but simply that it is adapted to a region of milder climate than that in which it is being grown.

Therefore, what evidence have we that a variety may run out? So far as fruit trees are concerned there is little or none to establish that a variety will gradually weaken in vigor and constitution and eventually die of old age although it has often been suggested.

(*Continued on page 30*)

## Apples or Aprons

(Continued from page 4)

used in the insecticide industry, which adds to the cost and the price of arsenic on the market has never been high enough to justify the investment to turn it out in quantities. A chemical engineer holds out the hope of increased production by finding and developing a low grade ore in which the commercial arsenical sprays can be produced without the cost of refining.

**Present Production**

The present annual production of white arsenic in this country is about 12,000 tons. Aside from this we have been importing about 4000 tons annually. The production abroad is just about equal to the home demands and altogether the world capacity for the production of arsenates is only about 30,000 tons.

Recent figures show that the normal planting of cotton is about 36,000,000 acres and on only about 20% of this or 7,200,000 acres is it practical to dust with calcium arsenate. In some places constant winds prevent the dusting of cotton successfully. In others lack of precipitation of moisture on the plants prevents the poisoning of the dew water which the boll weevil drinks.

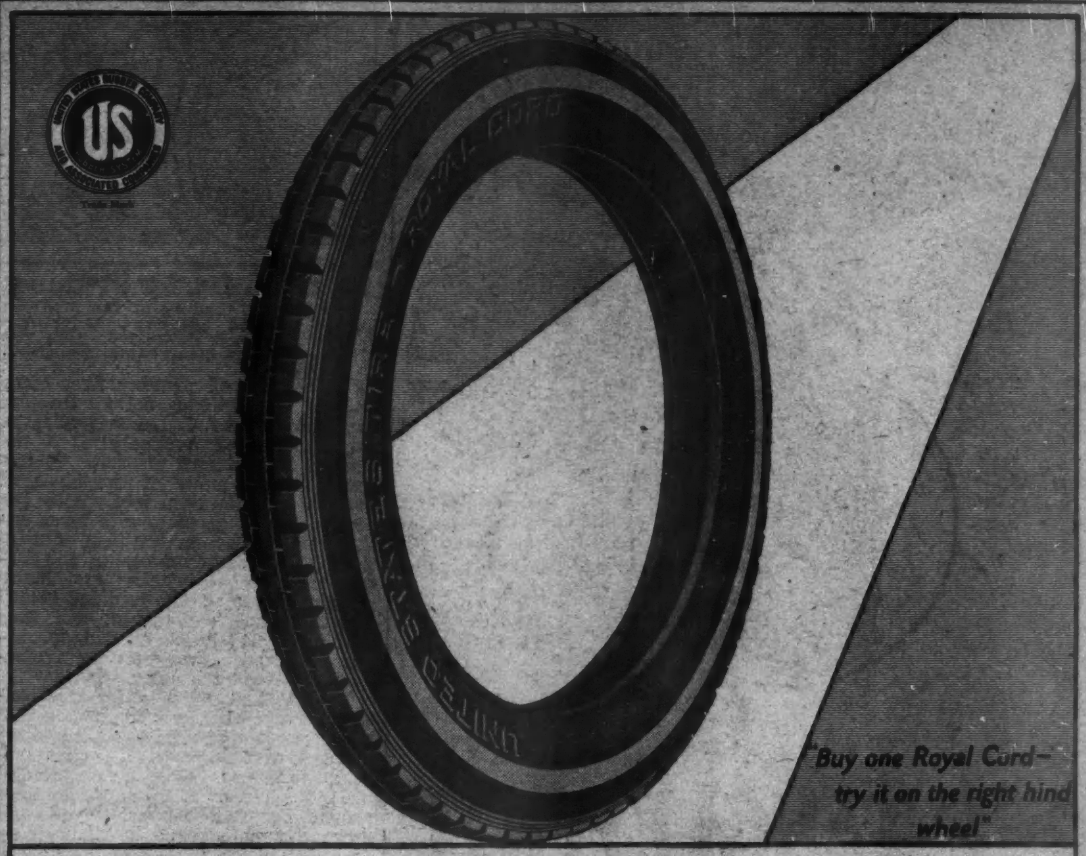
Calcium arsenate is made by combining the arsenic with calcium or lime in the proportion of 40 lbs. of arsenic and 60 lbs. of lime to each hundred weight of finished product. The lime acts as nutrilizing agent for the arsenic and prevents the burning of the foliage. Owing to the danger of the arsenic freeing itself from the lime after being applied, it cannot be recommended for fruit foliage but is harmless to such tough foliage as that of the potato or cotton plant. Arsenate of lead which is used largely by fruit growers is made by covering each little atom of arsenic with a coating of lead, and instead of sugar coated pills we have lead coated pills, only they are very minute in which to put our Mr. Codling Moth to sleep.

If all the arsenic in the world was made up into calcium arsenate and applied to the cotton fields it would probably be enough to dust the necessary cotton acreage. If enough arsenic is held out and made up into arsenate of lead to take care of the fruit and tobacco industry, if the glass industry insists on their quota, and a proper allowance made for cattle dips and other smaller industries there would only be enough arsenic left to make calcium arsenate to dust 2 million acres of cotton.

The problem again resolves itself into whether we shall have apples or aprons, oranges or organdies. Can the cotton farmer afford to compete with the fruit grower and other industries in this race for arsenic? Shall we give up the growing of fruit except on a limited scale that we may clothe ourselves? Shall we give up a certain amount of clothing in order that we may have fresh fruits? It is a serious problem and to be hoped that our chemical engineers will find a way out of the difficulty.

## Cherry Maggot

FOR years cherry growers in the east have been familiar with the cherry worm or maggot. Gradually this insect has worked its way west until during the past few years it is becoming a serious menace in some of our large cherry districts on the Pacific Coast. Cherry worm or maggot is a fairly easy insect to control, however, when proper precautions are taken. In early June the first spray should be given, a second should be followed about ten days later, and a third about a week after the second. These sprays would ordinarily start somewheres around the 5th to the 10th of June. A sweet mixture is generally very efficient. Calcium arsenate or lead arsenate, ½ lb., brown sugar 2½ lbs., or syrup other than honey, 2 quarts, and water 8 gallons. Do not spray as you would for ordinary pests. About one quart to a tree is sufficient, more might injure the tree. If the spray can be thrown on a few of the prominent branches of the tree, the flies which lay the eggs will be attracted by this sweet mixture and will be easily poisoned.


# To the new users of Royal Cords —probably a million in 1923

MOST rules are all the better for being broken once in a while.

There's an advertising rule, for instance—never to ask anvone to buy a thing and try it.

When the makers ask you to try a Royal Cord on your right hind wheel they may be breaking the rule, but you will benefit thereby.

The makers of Royal Cords, for their part, can't see why making friends should ever go out of fashion.

The more quality a tire has—and the more leadership—the greater its obligation to be simple and direct. Royal Cords earned their position of high regard by simple things.

You can easily see that people's confidence in Royal Cords could never have been won by quoting a lot of *big mileages*, talking *big* discounts, or going through all those other kinds of gestures with the idea of registering *big*.

The makers of Royal Cords devote themselves to guarding quality and have no desire to dazzle customers.

Their ideas seem to be right, because U. S. Royal Cords are the measure of all tire values today.

## United States Tires are Good Tires

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**30 VARIETIES STRAWBERRY PLANTS**—Dunlap $3.50, 1000. Premier, early, $6.00. Gibson Aroma, etc., $4.50. Cramptonlatest $7.00. New Champion Everbearing $15.00. Progressive Everbearing $9.50. Black Raspberries $14.00. 100 Champion Everbearing, post paid, $2.00. 100 Progressive, post paid, $1.25. 2-year Concord Grapes $6.00, 100. Gooseberries, Currants, 5, $1.00. 12 Grapes, $1.00. Catalog.
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# TREE TANGLEFOOT

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No climbing or creeping insects can cross a band of Tree Tanglefoot.

One application remains effective three to four months, *outlasting 10 to 20 times any other known substance.* Tree Tanglefoot has practically displaced all other banding compounds, wherever introduced.

A pound makes 12 lineal feet of band three inches wide. No expensive apparatus or skilled workmen required—easily and quickly applied with a wooden paddle; anyone can apply it.

Will not soften, run nor melt, yet always elastic, expanding with growth of tree.

Especially recommended against: Climbing Cut Worms, Tussock Caterpillars, Canker Worms, Gypsy and Brown-tail Caterpillars and Ants.

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Send today for free illustrated booklet on Leaf-eating Insects.

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# Orchard Problems and their Solution

by Paul C. Stark
Associate Editor

## Modified Leader Pruning

I have been reading of the Modified Leader pruning but don't understand exactly how it is developed. Can you give me a short clear explanation?—C. N. B., Illinois.

THIS type of pruning first came to wide-spread notice through the work of Prof. C. I. Lewis when he was director of horticulture of the Oregon Experiment Station. It has revolutionized many of the ideas of pruning and has been received by the practical fruit growers with much enthusiasm. The orchardists realize that it has the advantage of the former methods of pruning and many more good points. The modified leader system, properly followed, will produce a moderately low headed, spreading tree and a very strong framework that won't break easily.

The ideal modified leader tree consists of a central axis five or six feet tall (from the ground to the top-most branch) with seven to ten main scaffold branches evenly distributed around the tree. These main branches should be well separated up and down the main trunk of the tree — from the lowest branch to top branch will be a distance of three to four feet usually.

As two-year trees come from the nursery with branches already placed (usually without enough space between branches for the modified leader) practically all authorities agree that the one-year tree is far preferable if a true modified leader tree is to result.

In pruning the one-year tree, head back to about 30 inches. After the first season, select two or three well distributed side branches (removing the others) and head back the leader at least one-third of the new growth —at this time the space between the top side-branch and the point where the leader is cut back should not be more than 1½ or 2 feet. The side branches should be headed so they will not be higher than the leader.

After the second season the same process is followed thus adding about three more side branches. The third summer's growth will usually furnish the remaining necessary side branches after which the leader is discontinued (cut out just above the top-most side branch—thus making an open head at the top). Each main scaffold branch will be developed with side branches much in the same manner as the main trunk.

Short stubby growth in the center of the tree should not be removed as it will develop into fruit bearing wood and will increase amount of early bearing.

Prune as lightly as possible after your main side branches are placed because very severe pruning delays bearing and stunts the tree.

## Making Trees Grow

My young four year orchard is making a slow growth and I want to know how I can get the vigorous growth that some of the growers secure. My land is moderately fertile, gently rolling, and I could cultivate if advisable although I have just left the weeds and grass grow until now.—M. L., Indiana.

YOUNG orchards, just like corn or other crops, need good cultivation or the equivalent if satisfactory growth is to result. If you can cultivate without the land washing, I would advise you to do so—either in four-foot strips on each side of the tree row or the entire area, using most any cultivator you desire. If you had not already stunted your trees, the cultivation would probably be sufficient, but it would give you quicker and better results to use, in addition to cultivation, about two pounds of Nitrate of Soda or Sulphate of Ammonia applied just as growth starts in the spring. A good application of manure, although not as quick acting as the Nitrate, will largely take the place of the Nitrate.

## Pollenization In Apple

"I have read recently several references to the need of pollenization between the different varieties of apples. Please explain the reason and the best method to follow to get proper pollinization to the blossoms."—L. D. M., Ohio.

CERTAIN varieties are more or less self-sterile and require pollenization. In some seasons, this question of pollenization is much more important than in others. Sometimes, solid blocks of varieties will bear good crops, but when the pollenating season is very unfavorable, is the time that the orchard that is properly planted for cross pollenating purposes has the advantage over the orchard planted in solid blocks. In the average orchard where four to six varieties of well known commercial varieties are planted in alternate blocks of a few rows in each block, the cross pollenating, is, in most cases, satisfactorily solved. In planting my orchard, I went into the pollenating problem very thoroughly and as a result of my investigation and from information received from Agricultural colleges and from Horticulturists in various parts of the country, I decided on planting four rows of a variety, then four rows of another variety, etc. By planting in these four row strips, I was able to get the varieties well distributed in the orchard so that pollenating problem will not be a factor. It is advisable to plant in even rows such as 4, 6 and 8, thereby facilitating the handling of each variety as a wagon can drive between two rows, handling both at the same time.

## Climate and Trees

"In northern states, is it necessary that only northern grown trees be used? I would like to have your opinion."—F. S. B., Minn.

THE question of hardiness depends upon the variety. Tender varieties will be tender in northern states whether grown in the South, Central, West or far North. A hardy variety will be equally hardy in a northern state, no matter where it is grown. This question is well answered by Prof. S. C. Sears, of the Massachusetts Agricultural College, in his book "Productive Orcharding," "The argument of 'acclimated nursery stock' has certainly been overworked. Apparently the tree has the ability during the first growing season to entirely adapt itself to the new surroundings. The writer is fully convinced of the fact that it makes little or no difference where the tree was grown, so far as climatic conditions are concerned. What does make a difference is having good thrifty stock."

## Bridge Grafting Girdled Trees

Can I save my young three year old apple trees that were girdled by rabbits this past winter? If so, what is the proper treatment?—R. C. B., Ohio.

TREES that have been completely girdled can be saved by bridge grafting which consists in using young twigs with each end cut into a wedge shape which is slipped under the bark at top and bottom of girdled portion. The ends are bound securely or waxed over with grafting wax. Several of these twigs are used (the number depending on size of tree) and thus forming "bridges" through which the sap passes from the roots to the top of the tree.

## Northwest Apples

THE Managing Editor had the pleasure of meeting J. S. Crutchfield at the big conventions held in Chicago in January. Anything which Mr. Crutchfield says in regard to handling apples is worthy of the careful consideration of all growers. Mr. Crutchfield has had a wealth of experience in the packing, shipping and marketing of fruit. He feels much progress is yet necessary in the Pacific Northwest if the best results are to be realized. He stated that for years he urged his friends in the Pacific Northwest to handle the apples as though they were a peach crop, or to express it in another way, the apples of the Northwest are now handled by the growers, warehousemen, distributors and railroads as if they were a staple product, which results in placing apples in the category of a perishable product, whereas if the crop was handled by the growers, warehousemen, distributors and railroads as if it were highly perishable, it would, as a matter of fact, be a staple product.

The majority of the Northwest apples must go through cold or common storage before reaching the ultimate consumer and these apples must reach the consumer perfect in appearance and of high flavor. Obviously, then, the apples should be handled with extreme care and speed, as much so as the peach, which goes directly from the tree to the consumer.

Mr. Crutchfield feels that the question of technical grade in the Northwest has been worked out very well but that the matter of condition of the fruit and the pack, as to firmness and style, could be improved on greatly. There are some things which the grower has no control over, such as unusually hot weather and certain railroad problems, but the industry can prosper in spite of these handicaps if preventable troubles are corrected. Mr. Crutchfield believes that the railroads must furnish the districts enough refrigerator cars to handle the early and intermediate varieties at the harvest period, leaving the majority of long keepers like Winesaps and Newtowns to be stored at the shipping point. He feels that precooling and cold storage facilities at shipping points are very desirable but that they are very expensive and from the growers' standpoint, it would probably be better if cold storage facilities could be developed by outside capital and operated strictly as a separate business, in which event effort would be made to work out icing contracts with the railroads and other business, such as dried fruits, eggs, meat, etc., which would avoid the necessity of the fruit crop bearing the full cost of maintaining an expensive cold storage plant.

What Mr. Crutchfield says regarding Northwest apples is true to a large extent of apples no matter where they are produced. Readers of the AMERICAN FRUIT GROWER MAGAZINE will be pleased to know that Mr. Crutchfield has promised to give us some more light on this subject in the relatively near future.

## Vetch for Soil Building

HAIRY vetch, because of its adaptability to all the soil types of South Carolina, is the safest legume to sow as a winter soil building crop. It does well on soils ranging from sandy to heavy clay and will make a fair growth on soil so low in fertility that crimson clover would be a complete failure.

Vetch is a nitrogen gatherer of first importance. A growth sufficient to produce one ton of hay will contain approximately 50 pounds of nitrogen, and the stubble and roots of this will contain about 12 more pounds of nitrogen. This sixty-two pounds of plant nitrogen is equal to the nitrogen in about 417 pounds of nitrate of soda. Three-fourths of this is gathered from the air by the legume bacteria on the vetch roots and is a clear gain for the farmer. Besides converting air nitrogen into an available form, vetch prevents the loss from the soil by leaching and erosion of approximately 50 pounds of nitrogen per acre.

A tool made out of tree branches by a Finnish farmer—*Drawn from a photograph*

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THE above scene is not one of ancient times. As late as the summer of 1922 this man was struggling with his home-made tools to coax a bare livelihood out of the soil. His little acreage knew no modern farm machines. As a result he knew nothing of bumper crops, a bank account, or time for rest and enjoyment.

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Such equipment for increasing crop yields and for saving time and labor the *McCormick-Deering Dealer* in your vicinity always has ready for your inspection and convenience.

Tractor pulling McCormick-Deering Leverless Tractor Disk Harrow and Dunham Culti-Packer

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Equipped with a combination nozzle for light or heavy mixtures. Leak-proof shut-off. Can be furnished with an extension for spraying fruit trees. Free Book—"When, What and How to Spray." Write today for your copy, or ask your Home Town Hudson Dealer.

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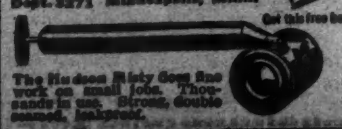

The Hudson Thirty Gem Sno work on small jobs. Thousands in use. Strong, double seamed, lockjoint.

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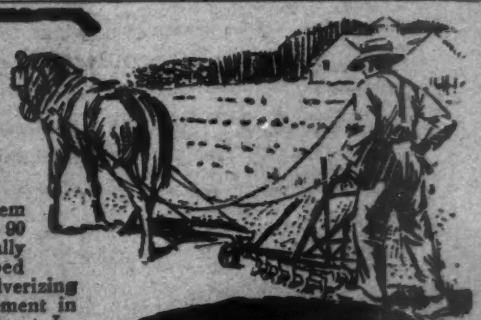

There are twelve of them on this Planet Jr. No. 90 cultivator, twelve specially hardened, chisel-shaped teeth, followed by a pulverizing rake. No horse implement in the world can equal Planet Jr. No. 90 for delicate work in small fruit cultivation, for ease and response in handling, for stiffness and durability. For crust-breaking, for mulching, for working up a fine seed or runner bed, No. 90 does the nicest kind of job. Equally useful for early cultivation of all row crops. See No. 90 at your Planet Jr. dealer. Write for latest Planet Jr. catalog.

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### "Dow" Powdered Lime Sulphur
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***Dow Powdered Lime Sulphur*** is first made in the well-known form of ***Dow Lime Sulphur Solution.*** Then the "DOW" Chemists use a specially designed apparatus to remove the water, leaving the Dry Lime Sulphur in effective chemical combination. Again, special "DOW" equipment reduces the material to a finely-divided, bright yellow powder—uniform and without lumps. This assures even working of the sprayer. The physical and chemical properties of ***Dow Powdered Lime Sulphur*** are guaranteed by the "DOW" Trademark. Be sure to look for

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***Calcium Arsenate.*** To kill Boll Weevil on cotton and for vegetable and plant dusting.

***Bordow.*** A copper fungicide—ready to use in control of various blights and fungus.

All "DOW" Sprays are of highest standard—finely divided, easily mixed and adhere most tenaciously. "DOW" shipping service, too, is accurate and prompt.

*Write for Free Spray Calendar*

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## —for fruits, vegetables and flowers

Fifteen years ago a change was made from the use of bordeaux mixture to lime sulfur. Today the pendulum is swinging back to bordeaux. And why? Not because both sprays are not good, but because neither has met the needs of fruit, vegetable and flower growers. Hence the present demand for *a better summer spray.*

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Sulfocide is a concentrated sulfur preparation in liquid form. When sprayed, it quickly decomposes, leaving a film of pure sulfur and carbonate of soda (non-poisonous and non-injurious) so fine that they are almost invisible except where drops accumulate. No dry sulfur can be ground so finely or applied so evenly.

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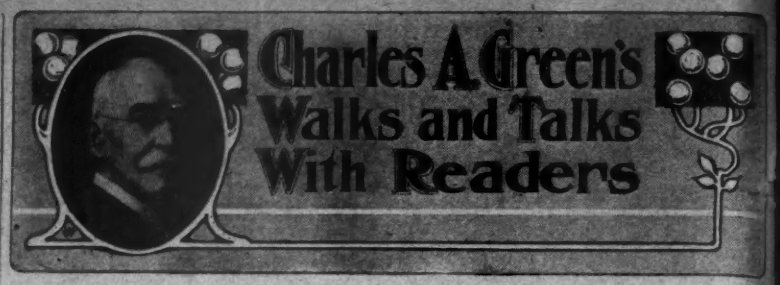
## A Better Summer Spray


## A Discovery in Fruit

WOULD fruit trees do well if planted along near the fences where the soil cannot be cultivated?—New Englander.

C. A. GREENS Reply. I have a ten acre strip of land in the suburbs of Rochester, N. Y. Not long ago I had grown a surplus of standard pear trees. Not knowing what to do with these surplus trees, I planted them along the line fence, covering about one-third of the border of the tract with pear trees. The varieties were mostly Bartlett, a good many Anjou and a few Sheldon, Lawrence and other odd varieties. My thought was that these trees would add to the beauty and salableness of this ten acre tract.

These trees received no cultivation. The past year every tree was heavily laden with fine fruit. We picked 140 bushels of superior pears. Last year we picked nearly 100 bushels of marketable pears. Altogether this planting has been a great success and is a suggestion for the farmer as well as the city man who has but a small lot. Supposing the farmer has 100 acres of land. There may be an opportunity to plant on the borders 100, 200 or 500 pear trees. Such planting would add to the value of the farm and would yield considerable revenue. If you prefer to plant apples you can do so, or cherry trees. Notice that the soil along the border line fences is exceedingly fertile, not having been cropped, therefore the trees will make a good growth when planted there. My trees received no attention and yet were exceedingly prolific and the fruit was of high quality. I do not advise generally this method of fruit growing, but it is adaptable to the wants and opportunities of a great many people.

Mice sometimes gnaw the bark of trees planted along fence rows, therefore I would advise banking up around each tree with earth just before winter sets in.

## The Fruit Garden of Childhood

I am an old man, but I am going to plant some fruit trees and vines so that my grandchildren can enjoy them, even though I do not live to see them bear fruit. What do you think of this plan?—Abner W.

ONE of the brightest memories of my childhood was the fruit garden planted by my father on the old homestead. These memories will never be effaced.

A lady writes me that she ordered of Green's Nursery Co. one dollar's worth of grape vines. She secured ten grape vines, which was a rare bargain. Lacking experience, she planted these vines two feet apart. Even with this close planting the vines thrived amazingly and soon began to bear delicious fruit. Her three year old baby girl, shown in photograph above, took great interest in these grape vines and visited them several times each day. Indeed she made a playground of these vines and their surroundings. The child's mother had other objects of beauty in this little fruit garden where the child spent so many happy hours.

Who can tell of the impression made upon this child's mind and heart by this little planting of fruit. If she should live to be a hundred years old she will never forget the beauty of the tempting colors of the grapes, and the blush upon the peach and apple.

Here is an argument, if argument is needed, to impress upon the mind of the reader the added attractiveness of home life and of child life where fresh fruits are grown in abundance.

## Fruits Preserved by Freezing

I AM surprised that we do not hear more through the press of this country about that which I consider a great discovery.

I have heard about the keeping of fresh picked fruit without the application of sugar or heat by simply freezing the fruit. I am told that strawberries, raspberries and many other fruits may be preserved in this manner, which must be exceedingly inexpensive.

I understand cans, barrels or boxes can be used, the main thing being to keep the fruit below the point of freezing.

This year there has been a tremendous crop of Early Richmond, English Morello and Montmorency cherries along the southern shore of Lake Ontario and throughout many parts of the state of New York. The crop has been saved largely through the freezing system which I have referred to. Ask your state experiment station for full particulars.

## How Far Apart

I AM thinking of planting a dwarf apple orchard and would like to know how far apart to plant my trees.

C. A. GREEN'S reply: If you are limited as to space for your dwarf apple orchard you can plant the trees 12 to 15 feet apart each way, but if you have a good supply of land on which to plant I would advise putting them 20 feet apart. This would allow you to crop the soil between the trees for several years.

Yes, I would branch the trees very low, about 2 feet from the ground for the lowest branches.

If you desire to make an apple hedge of drawf apple trees I would plant them 6 feet apart in the row and make the rows 20 feet apart or further so that that you could grow other fruits or garden crops between the rows.

## Trees

I HAVE several Norway spruce evergreens and they are branched close to the ground. Would it harm the spruce to trim off the lower branches close to the trunk? Which is the best month to trim them? Would trimming cause the trees to bleed or lose some of their sap?—J. W. C.

C. A. Green's Reply: Such branches as are alluded to on the Norway spruce can be removed at any time without injury to the trees, but in my opinion removing the lower branches would disfigure the tree. They would still be attractive but not so attractive as when they branched right out from the ground. Some times the lower branches turn brown and the foliage drops. Rather than have these bare dead branches to disfigure the tree I should remove them, though I would prefer to have them, if they were alive, branch down to the ground. Branches so cut will not bleed.

## Shoot the Rabbits

I AM interested in every living creature. I am mindful that the same God created the lowly animals as well as those of a higher degree of intelligence. But the innocent-looking little wild rabbit needs looking after with a sharp stick or with a ferret to chase him out of his hole or with the gun to knock him over. It is surprising what one hungry rabbit will do, what havoc he will accomplish in an orchard.

I assume that most orchardists have protected their trees with a thick veneer of wood or with stout paper or with a mound of earth.

## "The Shade of the Old Apple Tree"

By Wm. H. Wolff, Springfield, Mass.

### Well Fed Vigorous Trees Set More Apples

ORCHARD studies in Hampden County, Massachusetts, have shown that apple trees which made a vigorous start and opened the season with dark green colored foliage were able to bring a larger proportion of their blossoms through the unfavorable period at blossom time and set more fruit than trees which showed lighter shades of foliage. Further, that a liberal supply of soil nitrates early in the season resulted in securing a better setting of apples.

Observations last year showed that several of the more vigorous orchards of this section had a fair crop while others bore scarcely any fruit. We believed this could not be altogether accounted for by locality or orchard site. Again early in June of this year it was noted that while all orchards set some apples, the same orchards which bore best last year again had the most fruit. Was there any accounting for this outside of the usual evasive answer "weather conditions?"

### Vigorous Trees More Resistant

It was noted on the afternoon of May 12th, that petals of some McIntosh trees in the Dickinson orchard at Granville were browned by frost which occurred that morning, while Wealthy in adjoining rows were not damaged. Baldwin also suffered, but scattered individual trees of Baldwin and McIntosh can be picked out in this and nearly every orchard which showed high resistance to frost injury judging by the greater crop. The important point about these better bearing trees is that they were in every case the more vigorous individuals as indicated by their darker green foliage early in the season. In our orchard meetings and visits this direct correlation between shade of foliage and good set of fruit was called to the attention of probably 200 farmers and others.

### Preventing Frost Injury

It is well known that trees of a given variety which have borne a heavy crop, usually start the next season with a lighter colored foliage than those which did not bear the previous year. Very few Baldwin and McIntosh in this section bore last year and those that did are bearing more this year. It has also been observed many times that trees which have just completed a heavy crop are much more subject to winter injury than those which have just had an off year. Trees get ready to bear by storing reserve food, mainly starch, in the buds, branches and roots, in late summer and fall. Abundant plant food early in the season produces large foliage and the maintenance of this in perfect condition till late fall tends to increase starch storage. Chemical and microscopical studies in late fall and early winter have shown abundant storage of starch in the tissues of trees which are due to bear the next spring with little in trees which have just completed a crop. In the spring this stored starch is changed into soluble sugars, which enter into cell growth and are present to help more quickly repair injuries. The most important point, however, in this consideration is that these sugars probably serve to slightly lower the freezing point of the sap and the cell contents by increasing their density and so automatically afford increased protection against light frost damage to buds, blossoms and first leaves in the spring.

### Early Available Nitrate Helps

In the opening paragraph it was stated that a liberal early supply of soil nitrates resulted in securing a better setting of apples this spring. This does not mean that nitrates were added directly in each case observed although in some cases they were. It might be well to introduce a few notes of explanation relative to soil nitrates: Nitrates are formed from decaying organic material in all soils whether cultivated or not and have been shown to be the chief limiting factor in promoting growth and fruitfulness in apple trees in this section.

Grass takes up nitrate very early in spring and its vigor of growth and shade of color is a fair indicator of the relative amount present in the soil. Apple trees also respond to nitrate very quickly usually within 10 to 20 days and by June 1st will show a difference in color of foliage.

The amount of available nitrate can be increased most readily in early spring by applying nitrate of soda, ammonium sulphate or hen manure to soils.

### Effect of Nitrate on Set

Eric Anderson, of Southwick, applied 8 pounds of nitrate of soda on May 3, to large Baldwin and R. I. Greening apple trees leaving check trees with equal bloom. In each case the fertilized trees have at least doubled the crop of non-treated trees and the fruit was decidedly larger on June 9.

L. A. Stephens of Westfield and John W. McDermott of North Wilbraham applied poultry manure to large Baldwin trees in March. In each case these trees are bearing notably larger crops than similar unfertilized Baldwin trees in these orchards. These trees are in sod.

J. T. Geer of Three Rivers and A. M. Jones of Ludlow both have McIntosh trees by poultry runs which showed darker colored leaves and carried more fruit than other trees on either place. The darkest colored trees in each case are the heaviest bearers.

R. C. Newell of Three Rivers has 8-year-old Baldwin trees located beside poultry runs, which are darker in color and carry more fruit than similar trees 50 to 100 feet away.

### Color and Fertility

In ten orchards in this section, we were able in our visits and demonstration meetings to pick out individual trees of Baldwin and McIntosh which had the most fruit by the darker color of the grass growing under them as well as by the richer, darker color of the leaves of the trees themselves, both of which indicate a better supply of soil nitrate.

In the light of the above observations it would seem that in general nitrates have been applied too late to secure the maximum benefits. The date of application should be advanced to not later than that of the delayed dormant spray. May it not be possible that a difference in the time of applying the nitrates may account for the marked contrasts in results obtained by different state Experiment Stations, in their famous orchard fertilization experiments of recent years?

Does not this evidence give a new, practical and important meaning to the title of the old song, "The Shade of the Old Apple Tree."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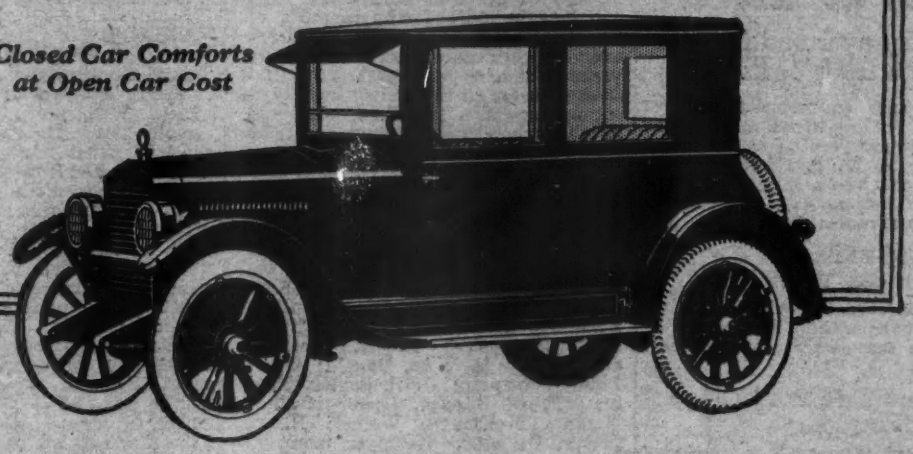

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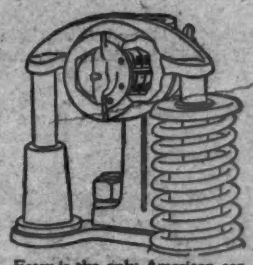

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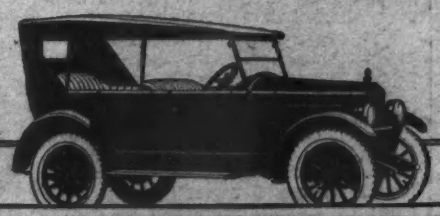

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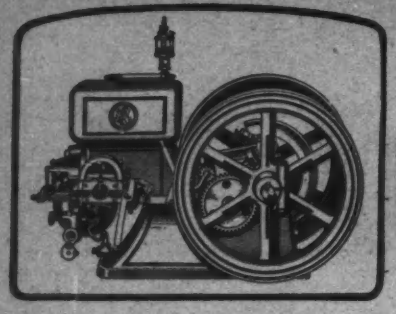

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# WITH THE CO-OPS.

THE Yakima Fruit Growers Association has had a very successful year. They have increased their acreage 32½ per cent and their membership 44 per cent during the year, and despite a light crop in parts of the Valley, the Association moved out over 100 cars more than they did last year. Some of the most influential fruit growers in the Valley have been signing up with the Association and in all probability a new unit will be established and a new cold storage plant built at Sawyer. This will give the Association a new unit in the best soft fruit territory in the Yakima Valley. The election of eleven trustees, ten to serve for two years and one to serve for one year, resulted in the following selection: J. J. Rudkin, Kennewick; E. E. Starkey, Biggam; C. A. Bragdon, Grandview; Austin Woodyard, Sunnyside; D. H. Clement, Granger; P. E. Wise, Donald; W. P. Palmer, Wapato; H. P. James, Yakima; F. O. Hansen, Lower Naches; William McKinney, Weikel; R. E. Pierce, Granger. Holdover members of the board of trustees are W. B. Armstrong, Yakima; S. C. Brown, Zillah; E. D. Knight, Wapato; F. A. Brown, Yakima; J. C. Scoon, Sunnyside; C. Swensen, Kennewick; N. H. Thompson, Grandview; G. K. Ewer, Selah, and J. T. Baird, Emerald.

The new board re-elected all the old officers of the executive body. They are Dr. H. P. James, president; E. D. Knight, vice-president; W. B. Armstrong, secretary, and C. H. Swigart, treasurer and general manager.

---

GRAPE growers of the east have been making some changes in their organization plans. These came as a result of the big meeting held at Buffalo, N. Y., January 23 and 24. This organization has been known as the National Grape Growers' Association and is comprised of twelve cooperative Concord grape associations in New York, Pennsylvania, Michigan, Ohio and Ontario. In the future it is to be known as the National Concord Grape Growers' Association.

The officers elected are F. B. Crawford, president; E. C. Gillette, vice president; W. H. Asbury, secretary, and Leo E. Prater, treasurer. These officers with Charles S. Aldrich comprise the executive committee.

The organization represents 62,000 tons of grapes. The members who attended the conference are as follows: Leo E. Prater, Paw Paw Co-op. Assn., Paw Paw, Mich.; Frank Crawford, Keystone Grape Growers' Co-op Assn., North East, Pa.; D. L. Thornton, S. Mich. Fruit Assn.; E. C. Gillette, Keuka Grape Growers' Assn., Penn Yan; C. J. Baldridge, Seneca Grape Growers' Assn.; C. S. Aldrich, Chaut. & Erie Grape Growers' Co-op. Assn. (east end); Fred Johnson, Chaut. & Erie Grape Growers' Co-op. Assn. (west end); W. H. Asbury, Western Reserve Co-op. Assn., Unionville, Ohio; H. E. Lilley, Eden Grape Growers' Co-op. Assn., Eden; C. A. Reynolds, South Shore Growers' Co-op. Assn.

At this meeting C. J. Baldridge reported that the grapes in his section were largely Niagaras and in the early season prices ranged from $85.00 to $95.00, the yield, however, being light owing to weather conditions, averaging only from 1 to 1½ tons per acre. Leo H. Prater felt that something ought to be done to correct unjust rejection of f. o. b. sales by speculators who refused to take the losses when a slump comes. E. C. Gillette reported that his association handled 130 cars, the yield ranging from 4 to 7 tons per acre, Niagaras bringing $70.00 a ton, Catawbas $35.00 and all other varieties averaging $75.00. After the freeze these prices were lowered somewhat. C. W. Aldrich felt that better growing conditions should prevail and the leaf hopper controlled.

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READERS of the AMERICAN FRUIT GROWER MAGAZINE are familiar with the fine record which the cherry growers of Sturgeon Bay district, Wis., have been making through their Door County Fruit Growers' Union. A recent report from the United States Department of Agriculture gives the following summary of the business handled:

"The Door County Fruit Growers' Union, of Sturgeon Bay, Wis., marketed over a million packages of fruit during the six seasons, 1916-21. Over 900,000 of the packages were 16-qt. cases of cherries. The other fruits marketed were strawberries, currants, gooseberries, raspberries, plums and apples. Sales of apples amounted to 8,552 barrels and 18,167 bushels. The number of cases of cherries for each of the six years are as follows: 31,371 in 1916; 104,758 in 1917; 32,792 in 1918; 205,453 in 1919; 188,080 in 1920; 344,695 in 1921.

"Figures are available indicating the total income, and the expenses, including depreciation and dividends, for the years 1919, 1920 and 1921. The totals for the three years are: gross sales and other income, $2,325,985.56; expenses, depreciation and dividends, $53.431.48. This latter total, which is 2.2% of income, is made up of the following items: salaries, $24,592.80; general expense, $21,058.23; depreciation, $4,404.65; dividends, $5,333.00; miscellaneous, $42.00.

"Revenue for the operation of the Union during the three-year period was obtained from the following sources: deductions from fruit sold, $29,036.16; gain from selling spraying materials, $5,034.13; gain from selling packages, $13,070.22; gain from selling fertilizers, $2,997.74; miscellaneous gains, $1,119.55.

"The net amount received from the sale of fruit was $2,083,422.09 and the deduction made by the Union for doing the selling was $29,036.16, which was but 1.39% of the net selling price. The growers, therefore, received 98.61% of the net sale price at shipping point.

"The Union is made up of 322 stockholders, 302 of whom are growers."

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THE Sun-Maid Raisin Growers announce the appointment of a new managing director, namely, Mr. Ralph Merritt. Mr. Merritt has been well-known in California for many years. He was former state food administrator, former university comptroller and was the organizer of the Rice Growers' Association of California.

Mr. Merritt is expected to take over a large part of the duties of President Giffen. Disposal of the entire raisin crop and the development of the Sun-Maid Raisin Growers to the greatest possible efficiency at the lowest possible cost will be the aim of Mr. Merritt. One of the first definite problems will be a study of the financing methods and the policies involved in handling the ever-increasing production.

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MEMBERS of the New Jersey Cooperative Fruit Growers and the Garden State Cooperative Potato Association have expressed satisfaction at this year's results. The fruit growers, with local branches at six points, marketed 250,000 bushels of peaches and apples at a selling cost of about 12 per cent. The fruit was distributed over a wide territory, extending from Florida to New England and as far west as Chicago. The organiza-


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ion is expecting to perfect its selling system to even a greater extent and is gratified with the progress which has been made in grading and packing.

The Potato Association sold over 300 carloads, at a total selling cost of 7 per cent.

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THE California Prune & Apricot Growers Assn. recently announced that they had already received in their warehouses more than 143,000,000 pounds of the 1922 crop of prunes, being the largest tonnage which the Association has received in its six years of operation, with the exception of the season of 1920. Though the crop is less than in 1921, the Association has received from 5 to 6 million pounds more prunes than it did two years ago. General Manager, H. G. Coykendall, reported that the Association was in a stronger marketing condition than at any time since its formation. There has been such a tremendous demand for the new two-pound carton of prunes that the packing plant at San Jose has been working on a sixteen hour a day basis since September 1st in an effort to catch up with orders.

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AT a recent meeting of the Florida Citrus Exchange much gratification was expressed over the success the Exchange is meeting in this year's marketing and while the season is only half over their grapefruit and oranges are selling in more markets than were covered during the whole of last season. The consumer demand is continually increasing and retailers are already beginning to do some advertising of their own to increase the consumption of Sealdsweet fruits. The aggressive campaign which the association has been carrying on for the past few months has brought results and has increased their membership.

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AT a recent meeting of the British Columbia Fruit Growers' Association Lionel E. Taylor of Kelowna was elected president to succeed C. E. Barnes, who for six years has held that office.

Growers all over the province are showing much interest in the attempt which is being made to form all the fruit growers of British Columbia into one large central selling organization, the organization being formed as a Sapiro organization. They hope to get a minimum of 75 per cent of the tonnage signed up but efforts will be made to get at least 95 per cent. A committee of seven has been working out all the details of this organization. It will be a typical commodity organization, having a long term contract.

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THE table grape growers of California recently held a meeting at Fresno and plans were discussed for the organization of a table growers association much along the same lines as the large California cooperative associations that sell deciduous fruits. It is believed that the new organization will operate along the same lines as the Sun-Maid Raisin Growers' Association since the latter organization has demonstrated its great success.

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A COMMITTEE of seventeen growers representing southern California apricot and peach growers has been appointed to form a central selling organization. Dr. H. S. Gordon of Nuevo is chairman of this organization committee and C. G. Hamilton of Hemet is secretary. Articles of incorporation have already been filed and the association expects to function this coming season.

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STRAWBERRY growers in the vicinity of Jackson, Ga., have recently organized the Butts County Strawberry Association. J. L. Bailey is president and J. D. Jones is secretary and treasurer. Members of the association already have 100 acres of berries under cultivation.

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THE North Pacific Cooperative Berry Growers' Association, with headquarters in Seattle, Wash., expect to handle a very heavy tonnage of berries this coming season. The Snohomish local expects to handle 200,000 pounds of Cuthbert raspberries. Canneries have already made offers for the entire tonnage.

The officers elected to serve this coming year are A. B. Newman, president; Nick Altman, vice president, and Torrence Springer, secretary.

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CALIFORNIA Avocado Growers' Association at a recent meeting voted a request of legislature to pass maturity tests for avocados and to prohibit the sale of alleged immature fruit. Various maturity tests were tentatively discussed.

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ESTIMATES collected by the United States Department of Agriculture show that over 70 per cent of the grapes from Michigan were sold cooperatively. More than two million dollars were received for 2,600 cars of grapes, averaging 12 tons to the car. The cars were shipped to 231 central markets in 34 states, going as far east as New England, as far south as Florida and west to Arizona and Utah. Only a few years ago Michigan grapes were being sold to a very few carload markets.

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AFTER an association has received sufficient members so that there is a tonnage guaranteed whereby the overhead can be kept down and a good permanent business carried on, it should be the aim of the association to consolidate what it has, to strengthen its organization as far as it has gone, to build up a good morale and to thoroughly organize the business which the association controls. This is much better than trying to grow too rapidly. The bringing in of a very large number of new members into the association, members who have never been used to co-operating, members who do not as yet understand the full significance of the co-operative movement is perhaps unwise. Only such a number should be brought in as can be assimilated and can be gradually educated up to the full meaning of co-operation.

The first few years of an association's life are the most difficult because the association has had to make up its membership of men who have largely never co-operated. It has had to have practically 100% of such men and it takes from three to five years to get them thoroughly imbued with the principles of co-operation; and yet, it becomes necessary to do this in order to secure enough tonnage to warrant establishing good sales connections and high capable management. However, after this is once secured a slow, gradual growth is probably to be preferred to a mushroom growth. Many an organization has been upset by bringing in too large a percentage of new members who are not tolerant of the conditions in the country as they exist and who are not willing to allow the association to freely work out its problems.

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**Nitrate of Soda**

applied at the rate of five pounds to ten pounds per tree in the spring, before blossom time usually represents the difference between a profitable crop of

**Marketable Apples**

and a poor crop of culls.

Reports of experiment stations and practical horticulturists all over the United States bear out this statement.

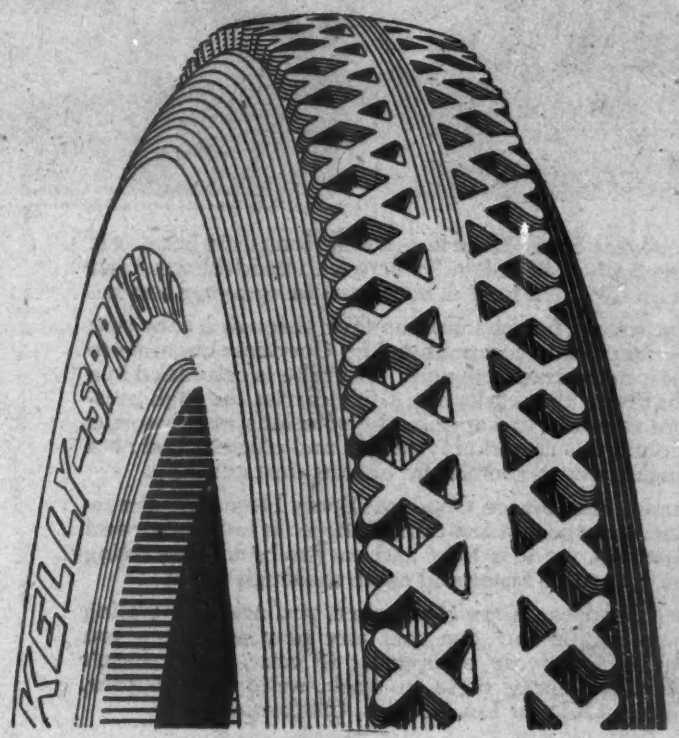
If you have never used Nitrate of Soda it will pay you to begin using it this spring.

Meantime send for my free Bulletin Service which is full of practical information on growing of all crops.

Dr. William S. Myers, *Director*
*Chilean Nitrate Committee*
25 Madison Avenue, New York



**KELLY SPRINGFIELD TIRES**




OF all the hundreds of thousands of Kelly-Springfield tires that are rolling on the country's roads today, only a small fraction of 1% came with the cars you see them on.

That means that when the tires with which these cars were originally equipped had worn out, the owner wasn't satisfied with the service they had given him, and wanted something better.

Kelly tires come as original equipment on a very few makes of cars—and those the more expensive. When, therefore, you see Kellys on a car, you know that it owner has bought them in preference to putting any money into tires of the make that were on it when he bought it.

That seems to us to be about the most convincing testimonial to the reputation of Kellys that could be offered.

Yet

**It costs no more to buy a Kelly**

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Goodyear Spray Hose lasts a long, long time because it is specially designed and built to withstand the wear and strain to which hose is subjected in spraying service.

The strong, biting solutions flow through a tube that is scientifically compounded by Goodyear chemists to resist deteriorating action. This tube is contained in a stout body that easily and safely carries the high pressure required to vaporize the solutions at the nozzle. Around this remarkably rugged and efficient body is a tough cover to protect the hose against abrasion.

Season after season Goodyear Spray Hose saves the replacement cost of less durable hose. It saves labor and time, too, for it is light and easy to handle, enabling the user to do faster and more thorough work.

Get Goodyear Spray Hose when you are overhauling your equipment. See that any new apparatus you buy is Goodyear equipped. If your dealer hasn't Goodyear Spray Hose in stock, write to Goodyear, Akron, Ohio, or Los Angeles, California.

GOODYEAR

SPRAY HOSE

FREE: Send name and get 25 everbearing strawberry plants free. Mason Nursery Co., Piedmont, Mo.

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## PACK YOUR APPLES IN PaSaCo BUSHEL BASKETS

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PASACO


# MARKETS AND MARKETING

GRAPES were a very important crop this year in the Chautauqua and Erie grape belt. Approximately five and one-half million dollars worth of grapes were sold, representing a tonnage of 78,570 tons, equal to 7,857 cars of ten tons net fruit each, bringing an average price of $700 and returning a total for the 1922 grape crop of $5,499,900. Only 14,560 tons were used locally in grape juice manufacture, representing but 18½ per cent of the crop, which is very small compared with previous seasons. The percentage used locally for grape juice manufacture in previous years was as follows: 1917, 44 per cent; 1918, 65 per cent; 1919, 56½ per cent and 1920, 30½ per cent. The year had its marketing experiences of car shortage, embargoes and freezes, which influenced the market to a certain extent. Nevertheless, the average price received will be somewheres between $60 and $65 a ton. Co-operative associations have claimed to have marketed about 50 per cent of the crop. The grape crop in this belt since 1900 is as follows:

| Year | 10-ton cars |
|---|---|
| 1900 | 8,000 |
| 1901 | 6,669 |
| 1902 | 5,062 |
| 1903 | 2,952 |
| 1904 | 7,479 |
| 1905 | 5,362 |
| 1906 | 5,364 |
| 1907 | 5,186 |
| 1908 | 4,323 |
| 1909 | 7,561 |
| 1910 | 5,700 |
| 1911 | 8,100 |
| 1912 | 7,528 |
| 1913 | 3,959 |
| 1914 | 8,386 |
| 1915 | 7,072 |
| 1916 | 4,307 |
| 1917 | 4,797 |
| 1918 | 2,067 |
| 1919 | 4,921 |
| 1920 | 5,350 |
| 1921 | 1,376 |
| 1922 | 7,857 |

ACCORDING to the United States Department of Agriculture the apple crop for the past few years has been as follows:

| | Total Crop Bushels | Com'l Crop Barrels |
|---|---|---|
| 1922 | 203,667,000 | 31,639,000 |
| 1921 | 98,097,000 | 21,204,000 |
| 1920 | 223,677,000 | 33,905,000 |
| 1919 | 142,086,000 | 26,159,000 |
| 1918 | 169,625,000 | 24,743,000 |
| Average, 1912-1921, bu. | | 185,798,000 |
| Average, 1918-1922, bbls. | | 27,530,000 |

The commercial crop this year is about 24 per cent larger than the average for the six preceding years.

The export in twelve months ending June 30, 1922, was 1,094,159 barrels. Over 12 million pounds of dried apples were exported against a ten-year average of nearly 25 million pounds.

According to recent figures issued by the International Apple Shippers' Association the total export of apples for this season up to the end of the first week in February was 1,370,786 barrels and 2,449,969 boxes compared with 983,909 barrels and 2,031,790 boxes for the same period last year.

The proportion of apples in storage in the Pacific Northwest is relatively small. At the end of the first week in February Wenatchee reported less than 2,000 cars of apples in storage, the bulk of which are Winesaps. The Yakima Valley had at this period approximately 3,473 cars in storage. The total shipments up-to-date in the Valley are 5,871 cars against 11,233 cars from Wenatchee.

The apple market has shown some improvement in the last thirty days, not so much in price as in demand. There has been a very good demand for barrelled apples in New York and Michigan. Baldwins in New York, "A" grade, two and one-half inches and up, are bringing $4.25 to $4.50 a barrel, f.o.b. Greenings are bringing $4.25to $4.75. Good stock has improved in most of the markets, but poor stock has dragged heavily. McIntosh in good condition have brought as high as $11 and $12 a barrel. In New York the best Delicious have been bringing $3 to $3.50 a box, while the best Spitzenbergs have averaged about $3. In Chicago up to the middle of February, extra fancy Jonathans were bringing from $2 to $2.50, according to size; Fancy, $2 to $2.25; Delicious, $3.25 to $3.50 and fancy Rome Beauties, large size, $2.15 to $2.25.

ACCORDING to figures furnished by the California Fruit Growers' Exchange, California will ship this season 11,365 carloads of lemons, the second largest crop in the entire citrus history. Already 795 carloads of this season's crop have been rolled, leaving 10,570 cars to be rolled between now and next November. These cars average 400 boxes each. In 1920 the crop was 11,865 carloads, being 500 more than this season. The estimate, however, for this next season is 2,000 cars in excess of the actual shipments in 1919 and 1920, and 1,500 cars in excess of the shipments in 1921 and 1922. The quality of the fruit this year is said to be fine.

An unusually extensive advertising campaign is to be conducted to advertise lemons. Approximately 25 million full colored pages upon the various uses of lemons will appear during the season in leading national magazines, in addition to campaigns in papers.

C. E. Stewart of the Florida Citrus Exchange is giving out some interesting figures on the movement of citrus fruits from Florida. The shipment of oranges for 1922 and 1923 is 13,659 cars, being an increase of 2,518 cars over last season. While the shipment of grapefruit is 8,403 cars, being 1,270 cars increase over last season, or a total increase of 3,788 cars, with a total crop up to February 1st of 22,000 cars of 360 boxes each, equalling 7,920,000 boxes. The average price is conservatively estimated at $2.50 f.o.b., meaning $19,800,000 of new money brought in by the citrus industry.

Spain is a very important citrus producing country. It is estimated that there are now 225,000 acres of oranges in Spain. The European market, especially England, takes the largest supply.

UNITED States Department of Agriculture reports a shipment of 19,000 cars of pears this season, the highest previous record being 15,000 cars in 1920. In addition, there was a very heavy tonnage of canning pears which will bring the total carload production to 35,550 carloads. Preliminary estimate showed 17,772,000 bushels of pears. California leads the Union with an average shipment of 4,400 cars annually. This year California handled 6,000 cars; New York, 5,000; Washington, 2,500; Oregon and Michigan, 1,800 cars each, these states producing 90 per cent of the pears of the United States.

The Bartlett is the favorite, although many Kieffers are shipped. All of the New York and Michigan pears are practically shipped in baskets and the western pears in boxes. The prices this year range from 25 to 40 per cent below last year's prices. However, western stock owing to extensive advertising is not showing so serious a decline.

R. G. PHILLIPS, Secretary of the International Apple Shippers' Association has given out some very interesting figures on the number of refrigerator cars in use or being built. At present there are from 120,000 to 125,000 refrigerator cars but approx-

imately 90,000 are available for fruits and vegetables. Some railroads and express companies are making a desperate effort to meet the situation as the tonnage has increased about 300 per cent while the car supply has increased only 70 per cent. The following figures show the cars completed, ordered or contemplated since 1920:

**Refrigerators Built**

| | |
|---|---|
| Pacific Fruit Express Co. | 4,000 |
| Atchison, Topeka & Santa Fe | 5,000 |
| Illinois Central | 2,000 |
| Baltimore & Ohio | 500 |
| Great Northern | 1,000 |
| Michigan Central | 250 |
| Chicago & Northwestern | 250 |
| Minneapolis, St. Paul & Sault Ste. Marie | 250 |
| Chicago, Burlington & Quincy | 1,300 |
| Northern Pacific | 1,000 |
| Fruit Growers Express | 100 |
| El Paso & Southwestern | 20 |
| Monon | 10 |
| Total built | 15,680 |

**Ordered or Contemplated**

| | |
|---|---|
| Pacific Fruit Express (ordered) | 3,300 |
| Pacific Fruit Express (authorized) | 5,000 |
| American Refrigerator Transit Co. (ordered) | 2,000 |
| Western Pacific Railway (ordered) | 2,000 |
| New York Central (ordered) | 1,000 |
| Michigan Central (ordered) | 500 |
| Union Refrigerator Transit Co. (ordered) | 1,000 |
| New York, Chicago & St. Louis (ordered) | 400 |
| Chicago & Northwestern (ordered) | 250 |
| Florida East Coast Railroad (ordered) | 175 |
| Philadelphia & Reading (ordered) | 100 |
| Chesapeake & Ohio (ordered) | 50 |
| M., K. & T. (ordered) | 200 |
| Grand Trunk (ordered) | 250 |
| Northern Pacific (Express) (ordered) | 70 |
| Santa Fe (ordered) | 2,000 |
| Fruit Growers Express (ordered) | 1,000 |
| Canadian Express (ordered) | 250 |
| Illinois Central (contemplated) | 1,000 |
| Chicago, Burlington & Quincy (contemplated) | 1,000 |
| Rock Island (contemplated) | 250 |
| Total ordered or contemplated | 21,795 |
| Total refrigerators built, ordered or contemplated | 37,475 |

ACCORDING to Oregon papers the Oregon Growers Cooperative Association has made a remarkable record this year, having shipped over 20 million pounds of prunes to 81 carload markets and 22 less than carload markets, giving a total distribution to 103 markets.

Over a million pounds of prunes have been sold this year in cartons, a one-pound carton going to England, a two-pound carton for apartment house trade, and a five-pound carton for the Canadian farmers.

THE Northern Pacific Railway is using a very attractive menu in the shape of a beautiful red apple. The menu is a work of art, having very attractive illustrations and some attractive write-ups on the use of the various varieties of apples. The Northern Pacific has always been famous for its dining car service and the care with which foods are prepared. It is gratifying to read in this menu that baked apples, stewed prunes or apple sauce can be had for twenty cents, an eating apple for ten cents and a whole orange for fifteen cents. These prices are much less than one frequently encounters in dining car service. The Northern Pacific is attempting to cooperate with farmers and producers along its lines.

THE Fruit Auction Co. of New York has been making some remarkably fine reports on auction sales of Argentine fruits. These have been arriving in our markets in good condition. Some of the better varieties of plums have brought as high as $9.00 a box of twenty pounds. Prices for some of the poor varieties have ranged from $3.25 to $9.00 a box for the best variety. Argentine and Chile are shipping in increasing quantities of melons and peaches, which are bringing very fine prices on the markets.

South African fruits have been reaching the New York markets, having been sold in the same auction at fine figures. Boxes containing 28 peaches each have ranged from $2.85 to $3.00 a box. A few very select boxes containing 21 peaches brought $3.80 a box, while some boxes containing only 18 peaches each brought as high as $4.75. Nectarines, running 36 to the box, brought $6.87, while a few running 24 to the box brought $8.00. South African plums 28 to the box brought $7.25 each, and apricots, 25 to the box, $4.50 each. These fruits are now being distributed in leading markets like New York and Chicago.

THE average shipper thinks that most of the produce and wholesale people are crooks. It is unfortunate that this feeling has grown up but it is partly due to the fact that there are too many men in the wholesale fruit game who are of questionable reputation, and it seems to be up to the organizations of brokers and produce men themselves, to celan their own house—that is, form some kind of an organization whereby men of shady reputation cannot become members.

Shippers must bear in mind that the last two or three years has been a period of readjustment and some firms that may have been in splendid shape for ten to fifty years have found themselves in financial difficulties.

It is very easy to find the rating of men. There are many sources from which this information can be obtained. In one city this past year we were astonished to find that one buyer was receiving a tremendous amount of produce and yet the trade generally knew this man to be an out and out crook who simply was mulcting the shippers out of about all they had. This man sooner or later was caught up and forced out of business, but many a shipper suffered meanwhile. Look up your agent and if you find he has a good rating and is giving you fair service, and you have no reason to suspect irregular proceedings on his part, our suggestion is that you stick to him. One of the greatest mistakes many shippers make is to keep changing brokers or commission men each year. They jump from pillar to post, not knowing where they stand. Get a good, strong agent, find out what he wants you to do, pack and ship the fruit in the way he wants you to do it, and stick to him. You will probably get better results in the long run.

## South Africa Stops Export Inferior Citrus Fruits

THE Government of South Africa has established new citrus fruit regulations for the purpose of preventing the shipment of inferior fruit to British markets, reports the American Agricultural Commissioner in London. The first consignment of this season's citrus fruit from South Africa, consisting of 762 cases of oranges and 366 cases of grapefruit, arrived at Southampton on board the S. S. Kenilworth on June 5. The Windsor Castle was scheduled to arrive during the following week with 1,415 cases of oranges and 116 of grapefruit.

The large profits made by South African exporters last season attracted many speculators, who made it their practice to ship indifferent fruit mixed with good quality oranges. This damaged the reputation of the South African exporters to such an extent that the government has taken steps to prevent similar practices in the future. It is expected that this year's citrus fruit shipments will exceed 350,000 boxes of high quality fruit, compared with 260,000 boxes of all kinds last season.

The regulations now in force provide that fruit for export shall be divided into two classes, Fancy and Choice, and prohibits altogether the shipment of inferior grades. The regulations further provide that no oranges which have not attained 70 per cent yellow, or orange color, may be exported. All boxes must be marked with the grade of their respective contents, and the minimum weight is 75 pounds per packed box at the railway station where shipments originate.

## Tasmanian Fruit

TASMANIA exported to England this past season which has just closed, 1,352,553 bushels of apples. A large tonnage of apples has been dried at Tasmania this past season, it being estimated that 300,000 bushels were used for this purpose. It is expected that Tasmania will export to England this season 10,000 boxes of dried apples.


# Selling Fruits at Public Sale vs. Private Sale

THERE'S a big difference between selling fruits at public auction and at private sale.

At the Fruit Auction Co.'s sales, all bids are made in open competition between a large number of buyers and the highest bidder is the buyer. Private sales are usually a dicker between the seller and one buyer at a time.

At Auction, the seller can sit in the Auction room, unknown to the Auction Company, and take down the buyer's name and the price bid, if he wishes. But if he cannot be present at the sale he can see the price paid published in the New York Daily Fruit Reporter. At private sale you don't know who is the ultimate buyer nor what price he actually paid.

At auction the buyers, sellers and the commodity are concentrated at one time in one place. This saves time, and time is money. At private sale the buyers and sellers are scattered, dickering one by one. This is a waste of time and thus a waste of money.

We mail all checks for fruits sold within twenty-four hours after sale. Cash for private sales sometimes takes weeks to arrive.

Thousands of carloads and shiploads of fruits are sold by public auction every year. Many of the largest growers use no other method of selling.

Why not YOU? Write us for interesting booklet "More Dollars for Fruit Growers."

**The Fruit Auction Co.**

Established 1896

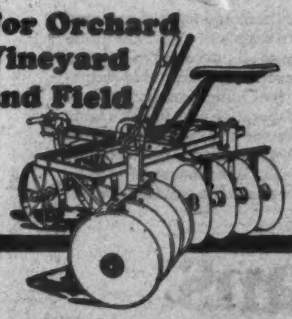
202-208 Franklin Street, New York City

**GOOD SEEDS**

Grown From Select Stock —None Better—58 years selling good seeds to satisfied customers. Prices below all others. Extra lot free in all orders I fill. Big free catalogue has over 700 pictures of vegetables and flowers. Send your and neighbors' addresses.

R. H. SHUMWAY, Rockford, Ill.

**For Orchard Vineyard and Field**



The John Deere Model "A" Disc Harrow is a real worker. Gangs can be spread apart to work under branches and vines, and for straddling rows, or set together for ordinary field work.

FREE BOOK. Write today for booklet describing this harrow. Address John Deere, Moline, Ill., and ask for Booklet FB-81

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$3.50 PER THOUSAND. Our strong, healthy, tremendous bearing plants guarantee big crops of luscious berries. Best varieties for all kinds of soils. Many new varieties such as Eaton, Bun Special, Premier, Marvel and Cooper. The worlds' greatest new Everbearing Strawberry CHAMPION. Full line of Raspberries, Blackberries and Asparagus. Greatly Reduced Prices. Our customers are making up to $1,200.00 per acre from small fruits. Large stock of good GRAPE PLANTS at $35.00 per thousand. Beautiful new color catalog free. Write To-day

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# California farmers make their own markets

*Bumper crops mean nothing if unsold*

California farmers were quick to realize this fact. So they said, "We must find markets. If none exist, we must make them."

Such a task, however, was too great for any single farmer. Combined effort was necessary. And in the organization of cooperative associations the farmers of California found the successful way to make their own markets.

Today the farmers of California have the reputation of being the most cooperative in spirit of those of any section of the United States. California leads every state in the union in the largest number of successful farmers' organizations.

How successful, you ask? Just consider these facts. In 1921, when the farmers throughout the United States faced economic disaster, California farmers were the only ones in the country who enjoyed prosperity. Their crops were sold, bringing reasonable profits in every line of farming industry.

For a farmer who has faced the market problem year after year and shouldered losses, this spirit of cooperation, as crystallized in the farmers' producing and marketing associations, must have a direct appeal. And California invites you to better yourself, to become one of her producers. With a reasonable stake to start with, there is opportunity for you here—in the Great Valley of California, or in one of the many coastal valleys adjacent to the great bay of San Francisco.

You will be anxious to read our book, "Farming in California." It gives you the information about California that will help you determine whether it is the place for you. Those who have contributed to this book know California agricultural problems from beginning to end. As you read what these experts have to say, you will be impressed with the sound and accurate manner in which the opportunities of California are presented.

It may be that you have specific questions to ask about farming in California. Feel free to call on us for advice. Californians Inc., is ready to serve you now.

**A few of the cooperative associations which have helped California farmers make their own markets**

*California Almond Growers Exchange · California Bean Growers Association*
*California Fruit Growers Exchange · California Lima Bean Growers Association*
*California Peach & Fig Growers, Inc · California Pear Growers Association*
*California Prune & Apricot Growers Association · California Walnut Growers Association · Central California Berry Growers Association · Pacific Rice Growers Association · Poultry Producers Associations · Sun-Maid Raisin Growers*

*Send for "Farming in California"—free!*

Californians Inc., a non-profit organization of California citizens and institutions interested in the sound development of the state, will be glad to supply you with authoritative information regarding these opportunities. If you are at all interested in a future that brings with it assurances of prosperity and a life under the most favorable circumstances, write at once for "Farming in California," compiled for Californians Inc. by R. E. Hodges, Associate Editor of the Pacific Rural Press, in collaboration with E. J. Wickson, formerly Dean of the College of Agriculture and Professor of Horticulture in the University of California. It is the fact-story of California's agricultural opportunities and California's agricultural life. It tells what can be done in California on a $3000 investment, a $5000 investment, a $10,000 investment. Californians Inc. will send you this book without charge. Fill out coupon and mail today.

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Please send me without charge a copy of your book "Farming in California"

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# Training the Tops of Apple Trees

By C. L. Burkholder Purdue University.

THERE is an old saying that "a stitch in time saves nine" and how often this old adage applies to the training of the bearing apple tree.

Few growers give much attention to the height of their trees until some day they suddenly realize that their trees are much higher than is desirable for the easiest and most profitable orchard management.

The tendency each year to add several feet to the height of an apple tree is of course normal and varies in amount with the distance of planting, vigor of the trees and the variety.

**Fig. 1—This York Imperial tree was allowed to grow too high and then was heavily cut back at approximately the dotted line on the picture. Note the heavy growth of tall straight branches which resulted in three years' time.**

No definite statement can be made as to the proper height but the fact remains that a great many orchards twenty-five years old and even younger have been allowed to get entirely too high, probably five to ten feet higher than would have been necessary and still have allowed the trees to carry the same bearing surface. Where this condition of affairs is recognized a council of war usually results and this five or ten feet of extra height is doomed to destruction. The date of execution is set for the following winter and the decree is carried out in a grand winter "slashing bee." All

**Fig. 2—A Grimes Golden which has had several years of top training. The terminal shoots are ready for another clipping back to lateral branches.**

goes well till the growing season opens up and then the tree naturally shows its resentment to this severe dose of discipline applied all at one time. It promptly sends up two or three hundred straight vigorous water sprouts—flags of protest against this kind of pruning, or rather neglect of timely pruning. If this growth is let alone for a couple of years it will put more height on the tree than was originally removed. (See Fig. 1.) This type of vegetative wood spends its energy in terminal growth with few or no strong lateral branches and is extremely difficult to get back to normalcy.

A few annual "clips in time" with the hand shears would have resulted in an entirely different shaped tree without disturbing the balance between the roots and top or without interfering with the regular fruiting habits of the tree. This training work in the top should usually start when the tree is fifteen to twenty years old but of course the age will vary widely with local conditions. When it is only necessary to make a few small cuts, removing two to three feet of the top, it is easy to cut a side branch. The diameter of such cuts is so small that seldom even one water sprout results and this energy is directed into lateral growth. Of course this training must be continued at least every other year and preferably every year at this age. Figure 2 is a tree which has been pruned annually and special attention given to top training. Figure 3 shows the same tree after pruning. It increased in height two to three feet the previous summer but most of this growth was cut back, because the tree is high enough. If allowed to go unpruned for a few years this tree would increase at least two feet in height each growing season which even in the course of four years would result in an increased height of eight or ten feet.

If such a tree is in a strong productive condition it is to be expected that it will be growing vigorously in the top and this growth must be directed at short intervals and not every

**Fig. 3—The same tree shown in Fig. 2 after pruning. Several feet of the top have been removed. Little, if any, water sprout growth will result and the tree is encourged to spread out instead of using this energy to increase its height.**

five or six years if a desirable height and shaped tree is to result. If this training work is started in time there is a very small amount of wood removed each season, so small in fact, that this part of the pruning can be carried out during the summer months if necessary. In the Buck Brothers orchard, Elberfeldt, Indiana, most of this work in the tops of the trees has been done during the summer when the regular orchard force were not busy on the other orchard operations. This suggestion, however, must not be construed to mean an indorsement of summer pruning. There is also much more danger in summer work of injury to the trees by bruising and peeling the limbs if the men work from the trees. This can mostly be avoided by taking care to use soft soled shoes and rubbers. Of course this whole matter of top pruning is only one phase of the regular pruning operation, but anyone who has tried to do a thorough job of spraying or pick the fruit from the top of a thirty-five foot tree will recognize its importance and acknowledge the necessity of timely training to avoid this natural habit of growth.

# The Orchard Home

## A Section for All Members of the Family

Edited By MARY LEE ADAMS

### Ye Have Eyes and See Not

PERHAPS that saying of Jesus, was not meant to apply literally to the material world. Yet it is true of many in a perfectly literal sense. One of the kindest lessons we can teach our children is to see and hear, really see with their eyes and hear with their ears, the lovely, commonplace, everyday things that surround us.

What a treasure of joy lies at our very doors, was borne in upon me as I read lately Hudson's "Birds in a Village." So intensely does he feel, I think I might say so sensitively does he vibrate to the music of bird notes, that actually I have derived an equal pleasure in reading his description of certain bird songs, as in hearing the song of the bird itself.

This is because an artist was interpreting his sensations with the simple fervor that marks the true poet. But there is none who cannot appreciate the beauty and charm of tree and flower, the grace, brightness and harmony of birds. Perhaps I should make an exception of the man who told me that he seriously doubted if, but for the poets, we would regard the song of a bird as anything but a rather unpleasant noise. Perhaps an early sparrow had awakened him at dawn. Maybe he was the exception that proves the rule.

The village Hudson visited for the express purpose of meeting his feathered friends, had no more to boast of than the ordinary country-side. Get the children interested this spring in noting the birds. The order of their coming. Their nesting habits. Let them protect and care for them, and realize that they are as true a gift of God as friends, or wealth, or any happiness.

### Are We Civilized?

WHEN we read of wars and strikes, of murders and child labor and inhumanity, we often feel that our civilization has failed. But when compared with some others, we may take heart as we see how far beyond them we have progressed.

Take Persia for instance—land of roses and rugs. Rugs of such beauty and worth that the designers take rank as artists along with painters, poets and musicians. Surely a people of such fine taste may claim a high civilization.

But what do we find where the most famous rugs are woven? There the web is hung against a wall, and as the threads are wrought in and the ends hang down, they must be tied in knots, and they must be tied cheaply. What is so cheap as child labor? Therefore children from the age of five, are employed to tie the knots. Some of them continue at this work until they reach maturity.

The child sits so close to the wall, facing it, that its legs cannot be stretched out. It must sit cross-legged tailor-wise. After a while the legs become considerably bowed. After a while longer, they have lost the power to walk. Parents or elders bring these disabled children in their arms and set them down to their task.

Imagine such a thing in America today! The hopeful note here is that Persia, as one of the 55 nations that are members of the International Bureau of Labor, has heeded the representations of the other members and has installed such seats as do not cramp the natural position of the legs of the child knot-tiers.

### Some Odd Butterflies

EVEN in this over-commercial age, the true love of art for art's sake, abides in the heart of the Butterfly Man of Christmas Cove. He refuses to sell his soul for gold. Were more of us inspired by his spirit the world would be a finer place.

No butterfly lover could resist the handsome yellow Emperor which I saw hovering over a bowl of hot-house flowers. "Oh! where did that beauty come from?" I exlaimed, for despite his airy poise I knew he could not that moment have fluttered in at the window. In the first place the window was not open. In the second place it was January, and in the third, a slender wire could be detected, on close inspection, supporting his light form.

"He came with this one," said my friend, pointing to a rich, dark-winged fellow with bright blue markings of metallic sheen. "He's made of wood," she added, "by a dear old man who lives at Christmas Cove on the Maine coast." It was hard to believe. The thinnest, lightest wood, delicately painted, sufficed to make the illusion perfect.

When summer tourists took samples of his work back to town, it attracted the attention of clever commercialists. Such firms as Van Time, contracted with him to fill orders. The orders began to come thick and fast. They piled up. They worried the gentle old man. He couldn't linger lovingly over the eyes on a gorgeous wing if he was to be on time with his shipments.

So he cancelled his contracts. He wrote that he could not endure the thought of learning to hate the thing he loved. Henceforth he would make butterflies at his leisure, and if you want one you must wait until he has finished it to his liking. Then you may pay for it on delivery.

### Paint Your Home This Spring

IT IS asserted, and I think with reason, that fresh paint on the dwelling improves the morale of the entire household. They feel more cheerful, more prosperous, and take a pride in their home. When spring cleaning time comes, you may sweep, scrub and refurbish as usual the inside of the house, but don't forget the outside.

Wouldn't it be worth while to dress it up in a new coat of paint? The neighbors will admire it and perhaps imitate your example. The tone of a community where plently of paint is used, is generally high and so are the property values. A house attractively painted, makes a stronger appeal to a purchaser than a better built one from which the paint is peeling. Besides it's a real economy to keep all wooden buildings well painted. Paint is a great preservative and prolongs the life of wood indefinitely.

Now, what color will you choose? White with green trimmings is always suitable in the country. It seems to fit in so harmoniously with its surroundings of trees and grass. There's something cheery about a yellow that's too sunny to be called cream and yet too subdued to be glaring. The words of the old song "A shady green spot, a little brown cot," call up a very dear picture. The choice is wide. We might almost say—any color, so long as it is wisely chosen, will make the house good to look at.

### Women Born Individualists

WOMEN are admittedly more difficult to organize than men. They like to express their own individuality, not as some one else sees it, but as it is conceived by themselves. Naturally, clothes being woman's undisputed field, they seek to express themselves in what they wear.

Those economists of Paris who sought to save much money for women workers by standardizing their clothes, ran so hard against this psychological fact that they had to give up in despair. We wonder whether there were any mothers in the league that wished "universal" hats on their sex. If so, they must long since have forgotten the days of their youth.

The story of the attempt and failure goes as might have been predicted. "Universal" shoes had prevailed to the extent of not being kicked off by the recipients. "Universal" dresses had been worn, though without enthusiasm. But when it came to "universal" hats, which alit to the number of 100 on the women's heads, they just naturally got a bee in those bonnets.

The very next day after the distribution, no two hats could be found anywhere near alike. The women had added and subtracted at will, and secured a result strictly feminine and varied.

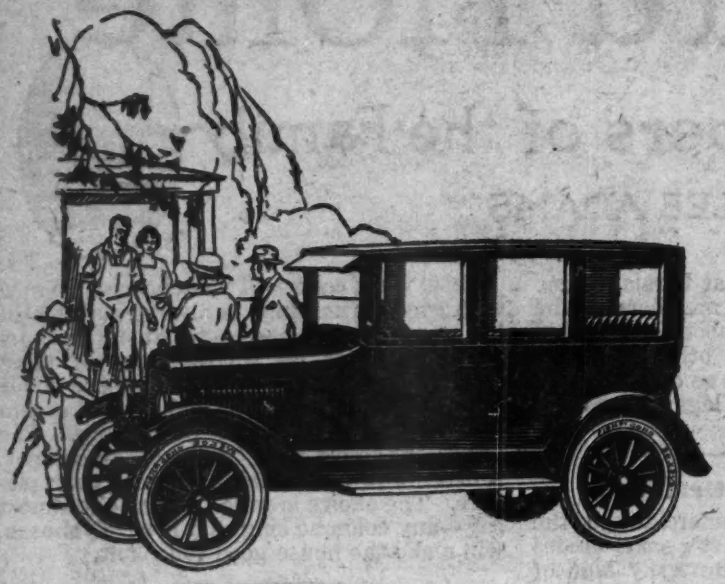
### Musings of Molly

A SINCERELY good man, asked if he had made his New Year resolution, replied that he always made it afresh every day of the year. His resolve was to endeavor to think right. He added, "A bigger man than I am, has told me that right thinking means God."

If the much-talked of Coue teaches us nothing else, he will have performed an inestimable service in calling—or perhaps recalling, our attention to the fact that, in a certain sense "what we think, that we are."

Have you ever seen a quite small boy so tired from a long jaunt that he could scarcely crawl? But when someone remarked that they had seen fresh cookies in the jar on the pantry table, how blithely and lightly he pranced up the hill to his home, leaving the sturdy, untired grownups far behind.

Here is a good thought for a tired woman. "The idea of fatigue necessarily produces fatigue, but the idea of a duty to perform gives strength to accomplish it."



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# Chats with Fruit Grower's Wife

By Hazel Bursell

## Saving Time in Dish-washing

MOST people don't really like to wash dishes, so why prolong it? A few suggestions may be welcomed by the farm house-wife.

To begin with, having the proper tools is a great aid to efficiency and speed. Among the things listed by experts are a wheel tray for bringing dishes, to and from dining room, a hand tray, dish scraper, sinks or pans for washing, rinsing, and draining dishes, soap shaker, dish cloth and dish mop, silver cleaning materials, small garbage pail, high stool to sit on when working, storage space near place dishes are to be needed, and a wire basket for draining plates.

### Don't Wipe all Dishes

It is not necessary to wipe all dishes. China which is washed in good suds, stacked on edge in draining baskets and rinsed with plenty of scalding water, does not need drying on a towel. Draining dishes saves time and is more sanitary. Irregular pieces, as cups and pitchers, should be wiped, as it takes extra space to drain them, and they would not drain well, either.

Dishes which are to be heated or are to contain food may be kept in the kitchen, as it is a waste of time to carry them to the dining room and back again for the next meal.

The worker will find that she saves time, if she has a certain order of work and follows it. An order which has been found practical is as follows: Bring the dishes from the dining room; scrape and stack each according to type, at right of dish pan; a preliminary rinsing of certain dishes often pays; have hot suds and plenty of scalding water; wash the glassware, silver and then the china; scald, wipe or drain.

### Clean up as You go

Dishwashing is more pleasant if you do not have to wash all the pots and pans after the china has been finished. It has proven economical to clean up as far as possible during the preparation of the meal. Many persons even prefer to wash all the pots and pans before beginning the china and silver.

The arrangement of the kitchen equipment has a great deal to do with the time required for the work. A direct route to the dining room is needed to save steps. The tables, sinks, etc., should be at the proper height for the worker so as to ward off fatigue. Cupboards with narrow shelves are more efficient—it takes extra time to put a double row of dishes away. The placing of heavy utensils on a level with the table saves time and energy in lifting them either up or down.

## How to Make a Sick Person's Bed

THIS is the season when colds and and la grippe make the rounds of the country, so the editor thought mothers might appreciate it, if the writer gave them explicit instructions for making up the sick bed—just as nurses are taught to make the bed.

If done in the right way the patient is more comfortable, the bed is more easily changed and freshened up later, and it is easier to handle the patient.

### Enameled Bed Best

To begin with the bed should be of the white enameled type if possible for ease in cleaning. It should be single or at most a three-quarter bed, and should be from 24-26 inches high without the mattress. If it is lower, remove the casters and elevate it with blocks, as it will save the strength of the nurse to have the bed higher. The bed should have a good spring.

Make the bed up correctly before ever putting the patient in. Begin by dusting the springs with a broom. Then turn the mattress endwise, from the top to the bottom.

Then put on the rubber sheet if it is needed, followed by a quilted pad that just fits the mattress.

The regular sheet comes next, and it should be large enough to tuck in well—at least 18 inches wider on each side than the mattress. Be sure that the crease is straight down the middle of the bed for the comfort of the patient. Use an envelope fold at the corners, so as to get a smooth fold. Draw the sheet tight from all sides.

### "Draw Sheet" Used

Next put on what is called a "draw sheet"—a regular sheet folded lengthwise and laid crosswise of the bed with the open side to the foot. Tuck in a little at one side, and later keep drawing it over to give the patient a fresh spot to lie on. This system will prove very restful to a sick person.

Put on the top sheet with the right side down and the seam in the middle. Have the sheet clear to the head of the bed, and tuck in the foot. Leave a little fullness at the foot for the toes.

Put on the blanket and allow some fullness. Then make envelope folds at the foot corners. Put on another blanket if necessary, and then use a hot water bottle for added warmth. The spread comes next. It should be of light weight, easily laundered material. Put a crease in the corners.

Turn the sheet down over the spread at the top.

Do not have too "fat" pillows, a small hair pillow usually being best. Always take the pillow away from the bed to change cases. Put it on the bed with the opening away from the door.

Now the bed is ready for the patient. Turn the covers back full length and loosen. Lay the patient in and straighten the covers.

### To Freshen Bed

To freshen the bed when the patient is in it, work with as few operations as possible. Remove the lower blanket and put on a fresh "drawsheet" at the same time. Then remove the upper blanket as the new sheet is put on. Put the top blanket back on.

It is well to add perhaps that a sick person's bed should never be touched if it can possibly be avoided. It is irritating whether they admit it or not.

## Caring for the Teeth

THE baby's set of twenty milk teeth should be complete at the end of his second year and these will serve him until the sixth or seventh year when the first permanent tooth will appear. The care of these first teeth is of great importance to the child's health.

### Dental Defects Common

Nearly all school children have dental defects as is shown by examinations of thousands of children in this and other countries. They include decayed teeth, protruding teeth, irregular and crowded teeth, and general uncleanliness and unsightliness. Often poor teeth mean poor chewing, and this in turn means poor digestion of food.

A reliable dentist should examine the child's teeth once or twice a year after the first set is complete. If cavities appear they should be filled with a soft temporary filling, and each tooth saved as long as possible.

The jaws and teeth require constant exercise from a very early age to insure proper growth and development. So every day the child should have some hard food which cannot be swallowed without chewing, such as toast, crusts, hard crackers, and as he

grows older, boiled, broiled or roasted meat. The use of some hard wholesome foods as apples, celery, and toast will aid in keeping the teeth and mouth clean.

**Teach Them Early**

A tooth brush should be put in the hands of the child very early. The mother should see that the child brushes its teeth thoroughly and regularly, after each meal and especially at bed time. The upward and downward motion of the brush is more effective than the crosswise, as the cracks will be cleaned in this manner. The inner surfaces should be cleaned as well as the outer surfaces.

If there are several children in the family, it would pay mother to think up some system or contest to keep the children themselves interested in doing "their bit" with the brush.

## Simple Etiquette Rules

YE EDITOR was turning the pages of an Etiquette book the other day, looking for something. She finally gave it up, muttering "Wonder why they don't put something in 'em for common ordinary folks—not just for smart society people?"

Then the thought occurred to her, "Perhaps all those ladies I talk to every month would like some common, every-day rules. I believe I'll chance it."

**Lists Simple Rules**

And so she did—she began with dining room customs.

1.—To begin with the guests seat themselves and rise at the close of the meal at a signal from the hostess.

2.—Do not unfold the large-sized dinner napkin to full size. It will not slide off the lap if left folded in half.

3.—It is not considered good form to break crackers up and put them in soup—they are eaten with the soup much as one would a bit of bread.

4.—Do not lay the slice of bread or cracker on the table-cloth. If no bread and butter plates have been provided, lay it on the edge of the plate. The butter is likewise put on the bread and butter plate if it is used.

5.—Never butter the whole slice of bread at once. Break it up and butter one section at a time. Lay even this piece down between bites, and let the left hand lie in the lap.

6.—Never leave the spoon in the coffee or tea cup after stirring it. Take it out of the cup and lay it on the saucer. Drink out of the cup — never the saucer or spoon.

7.—It is now very good form to eat the salad, garnishings and all, likewise one should practice the war-time doctrine of the clean plate.

**Use Fork Mostly**

8.—Almost everything is eaten with the fork nowadays, vegetables (even peas and corn) salads, meats, pie, cake, firm puddings and many fruits.

9.—It is now permissible to pick up chicken bones in the fingers and eat the rest of the meat in comfort. At least, this is true of informal and family dinners, but it might not hold true for formal banquets.

10.—Be pleasant at your meals. Enjoy yourself and see that your companions have a good time too. The main object in having rules of etiquette is so that we will know just what to do without worrying about it—then we can feel at ease and really enjoy the "party."

## Rhubarb Recipes

SOMEHOW we all look forward to rhubarb in the spring, possibly because it is about the earliest fruit. I thought that my readers would like some good recipes for rhubarb dishes, and here they are. Heading the list is the time honored rhubarb pie (they called it pieplant in the olden days), and the recipe given is my mother's pet formula. I assure you she makes good ones, m-m-n——

**Rhubarb Pie**

Prepare the pastry as usual and line a pie pan. Then fill the pan with ½ inch pieces of rhubarb, which has been washed and cut up with the skin on. Add a generous amount of sugar in which a little flour has been mixed (to thicken) and a small piece of butter. Lemon peel and cinnamon in very small amounts add much to the flavor. Put on the top crust and bake in a hot oven, to brown at first, then cool the oven and bake slowly till the fruit is tender. It is delicious served either warm or cold.

**Rhubarb Sauce**

3 cups cut rhubarb — small amount of water
2 cups sugar

Prepare the rhubarb as for baked rhubarb, cutting into ½ inch pieces and leaving the skin on, as it gives the sauce a pretty red color. Put in a granite saucepan and cook slowly without stirring till tender. Cool and serve. A tiny bit of lemon peel may be added for flavor.

**Rhubarb and Pineapple I**

½ lbs. rhubarb (2 cups when cut in ½ inch pieces) — ¾ lbs. sugar (1½ cups)
1 cup grated pineapple

Boil sugar and rhubarb together until thick. After letting stand together for ½ hour add pineapple and boil 5 minutes.

1 cup grated pineapple is equal to 1 can.

**Rhubarb and Pineapple II**

½ lb. rhubarb — ½ lb. sugar
1 cup pineapple (sliced) — ½ cup pineapple juice

Put rhubarb, sugar, and pineapple juice in kettle. Cut enough sliced pineapple (about 2¾ slices in very small pieces to make one cupful. Add to other ingredients and boil all together until thick, stirring frequently.

**Baked Rhubarb**

¼ cup rhubarb — 3 tablespoons sugar

To prepare the rhubarb, wash and cut without removing outer skin. Cut into ½ inch pieces. Put rhubarb in baking dish and sprinkle with sugar. Cover closely and bake in slow oven until tender.

**Orange and Rhubarb**

Peel oranges and throw away white part of rind and seeds. Cut oranges into small pieces and put into kettle. Add peel cut in small strips and rhubarb and sugar. Boil until thick stirring often. To six oranges use ten pounds of rhubarb and 1½ pounds of sugar.

**Lemon and Rhubarb**

1 lb sugar — 1 lb. rhubarb
1 lb. lemon

Peel lemon and reject white part of peel and seeds. Cut lemon in small pieces. Cut rhubarb in ½ inch pieces and place in bowl, add lemon and rind cut in strips and sugar. Cover and let stand over night. Next day put in kettle and boil slowly, stirring often for ¾ hours. Put in sterilized glasses, cool and seal.

**Rhubarb Marmalade I**

Remove peel in quarters from 8 oranges. Cook peel till soft in water enough to cover. Scrape out white part with spoon and discard it. Cut rind in small strips with scissors. Cut oranges in small pieces, removing seeds and tough skin. Put in kettle and add 5 lbs. of rhubarb cut in ½ inch pieces. Add small amount of water and boil ½ hour. Add 4 lbs. of sugar and rind of oranges. Cook slowly 1 hour or until thick, stirring often. Put in sterilized glasses, cool and seal.

**Rhubarb Marmalade II**

Wash and peel 4 lbs. of rhubarb and cut in ½ inch pieces. Put in kettle and sprinkle with 5 lbs. of sugar and add grated rind and juice of two oranges and one lemon. Mix, cover, and let stand ½ hour. Bring to boiling point and let simmer 45 minutes, stirring almost constantly. Put in sterilized glasses, cool and seal.

**Rhubarb Tapioca**

4 cups rhubarb — 2 cups corn syrup
½ cup pearl tapioca

Soak tapioca over night, drain, add boiling water, cook until transparent. Add syrup, fruit (blanched and cubed). Bake until rhubarb is tender. May add additional flavoring. May use other fruit.

**Rhubarb Baked Pudding**

4 cups rhubarb — lemon rind
2 cups corn syrup — spices
4-5 slices buttered victory bread

Blanch but do not peel. Cut in 1 inch length, bread in 1-inch cubes. Combine lightly. Add remaining ingredients and bake in buttered dish 20 minutes. Pan should be covered during first ten minutes. May sprinkle marshmallows over the top.

**Rhubarb Pudding**

Rhubarb foam — whites of 3 eggs (stiff)
2 cups dried rhubarb — ½ teaspoon cinnamon
⅔ cups water — ½ teaspoon nutmeg
1 cup corn syrup
1 tablespoon cornstarch

Blanch rhubarb as for canning, which induces sweetness needed. Cook until tender in ¾ cup water. Add syrup combined with cornstarch. Cook until thickened. Cool, fold in whites and flavoring. Serve with soft custard made from yolks.

**Baked Rhubarb**

3 cups cut rhubarb — 2 cups sugar

To prepare the rhubarb, wash and cut without removing the outer skin. Cut into ½ inch pieces. Put rhubarb in baking dish and sprinkle with sugar. Cover closely and bake in slow oven until tender.

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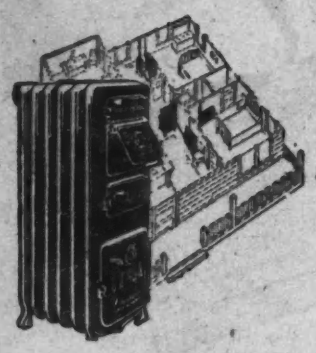

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Homespun, serge, wool jersey or a heavy crepe are suitable materials for this smart affair.

The pattern is cut in sizes 16 years, 36, 38 and 40 inches bust measure. Size 36 requires 3⅝ yards 40-inch material with 6¼ yards binding.

**1462. Two Smart Daytime Models.**

Just one paper pattern was used to make these two charming frocks shown in sketch A. and B.

The pattern is cut in sizes 36, 38, 40, 42 and 44 inches bust measure. Size 36 requires for dress shown in A. 2¼ yards 36-inch dark material with 1¾ yards 36-inch figured material, and ½ yard 40-inch white for vest and sleeve facing. View B. requires 3¼ yards 36-inch material with 2⅝ yards ribbon for sash.

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The pattern is cut in sizes 34, 36, 38, 40, 42, 44 and 46 inches bust measure. Size 36 requires 4⅝ yards 40-inch material.

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**1295. Handy Kitchen Apron.**

The pattern is cut in sizes 36, 40, 44 and 48 inches bust measure. Size 36 requires 2 yards 36-inch material.

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Tweed, jersey or serge are materials most suited to this trig-looking affair, patterns for which are cut in sizes 14, 16, 18 and 20 years. Size 16 requires 3¼ yards 44-inch material with 2¼ yards binding.

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**8420. New Dress for Baby.**

This little frock was especially designed for the tiny toddler.

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The pattern is cut in sizes 36, 40 and 44 inches bust measure. Size 36 requires 3¾ yards 36-inch material with ½ yard 36-inch contrasting.

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By E. W. Lehman

A WATER system, to provide running water in the home as well as in the barn yard, should be considered a necessity by every farmer. Water under pressure saves labor for someone nearly every hour of the day both in the home, and in the poultry yard and farm lots. It not only makes increased efficiency in doing work in the home and a saving of energy, that may be devoted to other things, but it often means better health and a better satisfied farm family.

A pure water supply should be the first consideration; a sufficient quantity to take care of the needs the second consideration; and provision of water under pressure the third consideration. A system that provides water under pressure will tend to encourage better protection of the water supply.

The part that running water plays in connection with the work in the home is not fully appreciated until the home is equipped so that running water is available for use in the kitchen, in the bathroom and in the laundry. It is one of the greatest time savers for farm women, and investigations show that it is the one class of equipment most desired by women on the farm.

The simplest type of equipment available is a sink, drain and pump. Such an installation can be made in any home where there is a shallow well or cistern supply. The only requirement is that the depth of the water below the pump cylinder is not more than 20 to 25 feet. This sort of system is inexpensive and can easily be installed by the average farmer. The total cost of the sink, drain and pump should be less than $25.00. The sink alone, without the pump, would be a big help in many farm kitchens, since the job of carrying out waste water is almost as big a one as carrying in the water for use in the kitchen.

The next step would be to provide a hot water connection so that both hot and cold water are available. This system can be installed without having water under pressure as is ordinarily thought by most persons. It is necessary, however, to provide a force pump instead of the ordinary suction pitcher pump, also a hot water tank is needed and a hot water coil or hot water back to be attached to the oven. With a three-way valve it is possible to secure hot and cold water from the same hydrant. This system makes it possible to pump both hot and cold water direct to the bath as well as to the kitchen sink. Such a system should be installed at a cost of not more than $50.00.

### The Gravity System

To provide a system that would always have water under pressure the gravity system is the simplest. It is only necessary to have a force pump and a storage tank to which the water is forced. The storage tank must be elevated to a position where it is above all faucets to be supplied from it. Local natural conditions will often make it possible for a farmer to locate a tank on a sidehill which will simplify the installation. Where this is done it is not necessary to excavate for the tank. The pipe leading to this tank should be carried below the surface of the ground below frost line so there will be no danger of it freezing. In many places where the gravity system is used the tank is placed on a tower or inside the residence on the second floor or in the attic. The chief idea is to place it above the faucets.

The proper storage capacity of the tank must be given consideration. This will not only depend on the needs of the farm, but also on the kind of power used. If hand power is depended on, the storage capacity of the tank would not need to be so very great, since a little time could be devoted each day to the work of pumping. If a gas engine is available the storage capacity of the tank should be sufficient so that the engine would not have to be started more than once or twice a week, and if a windmill is depended on, the tank should be sufficiently large to provide storage for at least two weeks so that there will be no danger of the supply of water giving out during periods when the wind would not supply power.

### Pneumatic Types

The pneumatic water system can be divided into two types, one in which air and water are both in storage and the compressed air forces the water from the tank to the various faucets. The second type is one where only air is in storage and it operates an automatic pump located in the well and supplies fresh water direct to the faucets. The first type is the one that is more commonly used.

During recent years the development of the pneumatic water system has been more toward the small tank type where the pump is operated by an electric motor with an automatic control. This virtually makes it a fresh water system. The chief point to keep in mind in connection with a system of this kind where a small storage tank of only a few gallons is used, is to select a system with a pump of fairly large capacity, sufficiently large to supply water to several hydrants when used at the same time. With electric power available this system is a very satisfactory one since the control automatically starts as soon as the pressure drops in the tank.

The chief points to keep in mind in the selection of a water system, as in the selection of any other equipment for the home, is to select a plant that is made by a reliable company, one that will give service, and one for which parts can be easily obtained. The local dealer is always an important factor to be considered in the selection of such equipment. Some dealers will take a much greater interest in seeing that their customers get better service than others. Such a dealer is a good man from whom to secure a water system.

## Plant Some Grapes

GRAPES cost money in the market, but they cost very little to grow for home use. A few cents buys a yearling vine and any space large enough for a rosebush will do for planting. The roots will practically take care of themselves, if they have any chance at all. The vine can be trained on the side of a wall or allowed to climb a tree, if it is not convenient to fasten it to a trellis or post.

If you have never grown grapes you will be surprised at the little care required and the amount of fruit they will bear. It is not to be supposed that they do not respond to care, but even when neglected they often bear large crops of fruit year after year.

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## Baldwin Losing Ground?

(*Continued from page 14*)

We might assume that a variety inherits a certain constitution and characteristics and that these continue unchanged as the plants are propagated by budding or grafting. Any radical change from the average of the variety in vigor, yield, color etc., would occur only by means of a "bud sport" or what is termed mutation. That such changes do occur seems to be well established but it is not likely that a whole race of apples, such as we have in a variety, would be affected in this way because they are not all propagated from common stock.

**Barometer of Public Opinion**

In this country we frequently resort to the court of Public Opinion, and in this case it is worth while to inquire what varieties are being planted in the sections where the Baldwin has long held sway. To do this, letters were addressed to a few nurserymen in different localities to obtain an indication or "straw vote" on the present tendency of planters. Sales outside the Baldwin district are beside the point, but orchardists frequently buy their stock from a distance and hence the inclusion of a wide territory in the inquiry. The states included were Ohio, New York, Michigan, Maryland, West Virginia and Missouri. The following is a list of the best sellers and the number of times they were mentioned as such: Delicious 11, Baldwin 9, Jonathan 8, Stayman 8, McIntosh 8, Grimes 6, Wealthy 5, Yellow Transparent 5, Rome 3, and others were mentioned once or twice as best sellers by several of the nurserymen. How much a more extended inquiry would change the rank of these varieties cannot be stated but probably it would place the McIntosh higher and the Baldwin somewhat lower. Practically all indicated that their sales of Baldwin trees had materially fallen off during the past few years. With several it still held high rank while with others such sorts as McIntosh and Delicious were far out-selling it. One large company (Maryland) states that for the past few years there have been at least twice as many McIntosh sold in the New England states and New York as Baldwin. Another (Missouri) states that the demand for Baldwin has fallen off rapidly within the past 10 years, that formerly they grew it largely but now it is necessary only to grow it in a small way to take care of small orders. "It is very seldom that we sell a commercial orchard of Baldwins. We sell about three times as many Delicious in New York State as Baldwin."

**What Will Take Its Place?**

This is a question we have heard discussed many times but have not yet heard a satisfactory answer. After the devastating winter of 1917-18 when entire orchards were destroyed in the State of Maine we talked with many growers who had decided to replant to Baldwin because there was no other kind, in their judgment, so suitable for export. The McIntosh has been widely planted in New England and New York but it is difficult to grow because of scab, it is tender to handle, and does not have a long season. It is a fancy, high quality apple which fills an important but different niche in appledom than the Baldwin. That the Delicious will take its place few would claim, and such old sorts as Greening, Spy, and Hubbardston are out of the question. The Grimes, Jonathan and Stayman are all splendid sorts but do best in the regions to the south and west of the Baldwin belt. There are a number of varieties that are sufficiently hardy but do not have the other requisites for a general purpose apple of the Baldwin class. There are several new ones at the New York and Canadian Experiment Stations that look promising and the real successor of the Baldwin may eventually come from one of these.

Finally then, is the Baldwin losing ground, and if so why? Undoubtedly there is a marked falling off in its planting which can be interpreted only as a lessening in its popularity or, bluntly, an affirmative answer to the above question. But it is not losing ground in the sense that the Ben Davis apple or the Crawford peaches are, for it is still widely planted and still is preeminent as an American fruit. In my judgment it will continue to be planted and largely grown in the regions to which it is best adapted. This will be portions of southern Main, southern New Hampshire and Vermont, Massachusetts, Rhode Island, Connecticut, western New York and northern Ohio. Other states of course will plant it to some extent but north of this general belt it will not withstand the winters and south of it the fruit ripens too early for profitable culture. But total dependence will never be placed in it again and the newer orchards will have other good or better sorts as companion plantings, and this will be to their advantage. Varieties that are of higher quality, such as McIntosh and Delicious are gaining in favor as the market learns to know them, and furthermore the Grimes, Jonathan and even the Stayman are encroaching on the southern limits of the Baldwin territory.

As to the other side of the question—is the variety running out? I do not take very seriously. It is mostly notion or fancy. It would be difficult for either side of the controversy to prove their point beyond question. It is my own judgment that the variety is practically the same as it has been—sensitive to soils and other environmental changes, rather tender, inclined to be biennial in bearing, and subject to stipened; but cosmopolitan, a strong grower, a heavy producer and a good handler for domestic and export trade.

## In the Orchard

(*Continued from page 12*)

**Setting Trees**

Trees can be set out in the spring quite late provided the trees themselves are dormant, although as soon as the ground becomes mellow and warm the sooner we can set the trees the sooner they will become established and start in growth. The pruning of these young trees can be done after setting, that is, at least the top pruning. In case of cherries, the top pruning has to be quite severe. With peaches it is sometimes better to leave a few buds on the side laterals rather than to trim off the entire laterals. Old broken roots should be cut away and injured portions should be cut to clean wounds. Years ago we used to fight to take care of the little hair and fibrous roots. We find out now that they do not amount to a great deal, that new fibrous roots come out and the old ones die. Where two year old trees have been planted, quite heavy cutting of the top is essential because a large proportion of the root system has been left in the soil and you must bring back a balance between the root and the top if the trees are expected to start in to good vigorous growth early in the spring.

**Cutting Out Borers**

Spring is the time to begin cutting out borers especially in peach and prune trees. A careful inspection should be given of the orchard. With a sharp knife and a sharp pointed wire many of the grubs can be caught at this time, while they are still near the interior of the tree. Later a treatment can be given in summer such as the bichlorobenzine treatment, but with any treatment some supervision must follow and the spring is the time to give this careful supervision. Stone fruits like the sweet cherry which gum badly and have gummosis should be treated at this time of year. Cut out the gum pockets and old wounds with a sharp knife, leaving a good clean wound. Sterilize this with blue vitrol and fill in with Bordeaux paste, the formula of which we have published in this paper on numerous occasions. Give the cherry trees the best care possible, get them to growing. There is no spray known which will control gummosis but the cutting out treatment as suggested, coupled with good growing conditions should help to control such diseases.

# Washington Naval Orange

(Continued from page 7)

twigs which were dry and dead. He then wrote again requesting that a few trees be grafted on young stocks giving careful directions for preparing and shipping them. A box arrived in 1870 containing twelve newly-budded trees in fairly good condition. As no expenses were charged in connection with these trees they were considered a gift to the government. Previous to their arrival Mr. Saunders had secured seed from oranges bought in the Washington market and he grew a number of seedlings in the government greenhouses. As fast as buds were available from the trees received from Brazil they were inserted on these seedling stocks and in this way a larger supply of trees was secured for distribution and trial.

Dr. Waddell, referred to above informed the Agricultural investigators that he had been told by the Rev. F. I. C. Schneider, the first Presbyterian missionary to Bahia, that he was the one who had secured and packed the trees which were sent to the United States in 1870. Mr. Schneider told of an earlier shipment from which word was received that the trees had all died in transit. Some one then requested him to prepare a shipment as carefully as possible and he did so.

Interviews with several old friends of Mr. Schneider resulted in finding one, Carlotta da Boa Morte, whose mother had been a servant in the Schneider household who clearly recalled the incident of this shipment. Mr. Schneider took her with the rest of the family for a picnic to Engenho Velho, a large farm in the suburbs of Bahia, owned by Sr. Teixeiro and they there secured the trees which were sent to Mr. Schneider's home in the city where they were packed in a wooden crate and dispatched to the United States.

The most of the young navel trees grown by Mr. Saunders in the Washington greenhouses, together with the twelve trees received from Brazil were distributed to orange growers in Florida, only a few being sent to California where citrus trees were then grown to a very limited extent. At the request of Mrs. Luther C. Tibbets two of these trees were sent to her at Riverside, California. Nothing is known about any of the other trees sent to California except that it is said that some were later sent to Alexander Craw of San Diego. So far as known the entire population of all present Washington Navel groves in California trace back to the Tibbets trees but some of the old navel trees in Arizona came from Florida.

### Early Name

The trees sent out by Mr. Saunders were distributed under the name "Bahia" because the variety had been introduced from that city but no attention seems to have been paid to this name. They were first called "Riverside" Navel but other districts in the California citrus section objected to the advantages which might accrue to that city from the name. The name Washington was often applied to the variety in the early days because the trees had been received from that city and a mutual agreement was finally reached to call it the "Washington Navel."

In Florida the variety did not succeed well being unproductive and of rather poor quality and it has never been grown to any extent in that state. In California the variety proved to be superior to anything previously grown and the fruiting of the first trees gave a decided impetus to orange growing in that state.

A few buds were taken from the trees sent to Mrs. Tibbets soon after their arrival by one of her neighbors and budded into some young seedlings which had been planted in orchard form and because of the greater vigor of these trees one of them fruited a year or two before fruit was borne on the original trees, probably in the winter of 1876-1877. The superior character of this fruit was at once recognized and it carried off the premiums at all the fairs where it was shown. So many buds were cut from the original trees during the next few years that their growth was greatly retarded. It is said that many buds from these trees were sold at $5.00 a dozen and that $1.00 per bud was frequently paid by people who were anxious to make sure of securing the genuine Washington Navel variety. High barbed wire fences were finally built around the trees to prevent thieves from stealing buds from them.

In 1903, after the death of Mr. and Mrs. Tibbets, one of the Tibbets' trees was given by the executor of the estate which then owned them to Frank A. Miller, proprietor of the Glenwood Mission Inn at Riverside and on May 7th it was moved to the courtyard of the hotel at which time it was thirty years old. Pres. Roosevelt who was a guest at the hotel at that time assisted in the exercises of transplanting the tree on the morning of May 8, 1903. It grew well in its new home and bore good crops of fruit for several years some of which was sent to the President each year. About fifteen years later excessive manuring by an overzealous gardener killed its roots and so weakened the tree that efforts to save it by inarching seedlings into its trunk were unsuccessful and it died in 1921. Figure 3 shows this tree as it appeared in 1916.

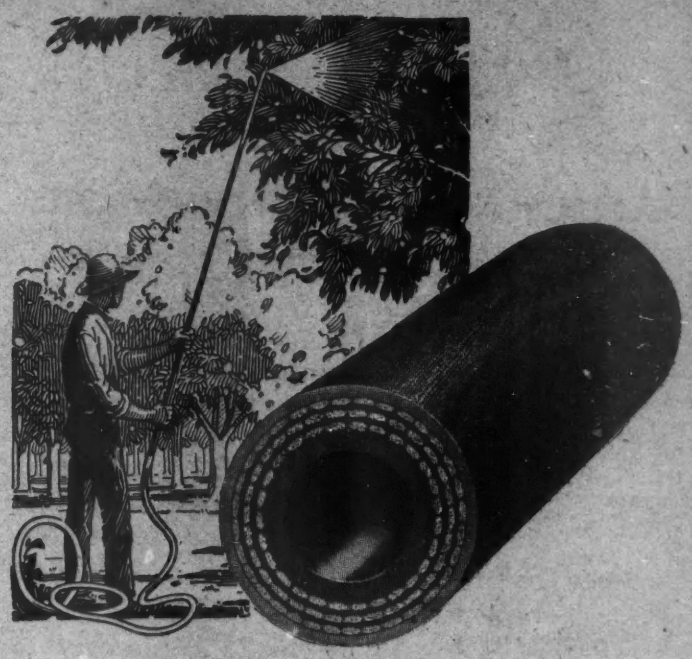
The other Tibbets' tree was given to the City of Riverside and moved to a plot at the head of old Magnolia Avenue where it still stands in good condition surrounded by an ornamental iron fence.

Another tree which traces back to the importation from Brazil is growing satisfactorily in the citrus greenhouse in the grounds of the U. S. Department of Agriculture in Washington. It was moved there about 10 or 12 years ago from a very unfavorable location in a greenhouse in the Government Botanic Garden at the head of Pennsylvania Avenue where it had been badly neglected until it was in a very weakened condition. To commemorate the interest and care taken by Mrs. Tibbets in securing and growing the two trees which have proven to be the progenitors of the Washington Navel orange variety which makes up the greater part of the orange industry of the Southwest, a beautiful bronze tablet has recently been placed on a granite boulder at the base of the surviving original tree which is now nearly 50 years old. It was secured and unveiled under the auspices of the Landmarks Committee of the Daughters of the American Revolution and bears the following inscription: "To honor MRS. ELIZA TIBBETS, and to commend her good work in planting at Riverside in 1873, THE FIRST WASHINGTON NAVEL ORANGE TREES in California, native to Bahia, Brazil, proved the most valuable fruit introduction yet made by the United States Department of Agriculture—1920."

Mrs. Tibbets little realized the far reaching importance of her request for these trees from Mr. Saunders but had it not been for that action it is probable that the Washington Navel industry would now be many years younger than it now is, if indeed it would be established at all. None of the trees distributed to Florida showed any such especially desirable or superior qualities as to recommend them for further trial and but for the trees sent Mrs. Tibbets the introduction by Mr. Saunders might have turned out valueless rather than the founding of a new industry.

## Food in Packages

THE U. S. Department of Commerce reports there is a great increase in popularity in foreign countries, of foods put up in sealed packages. In China especially, there has been an increasing demand for this class of goods. Of late years more and more prunes, peaches, apricots and raisins are being packed in cartons.

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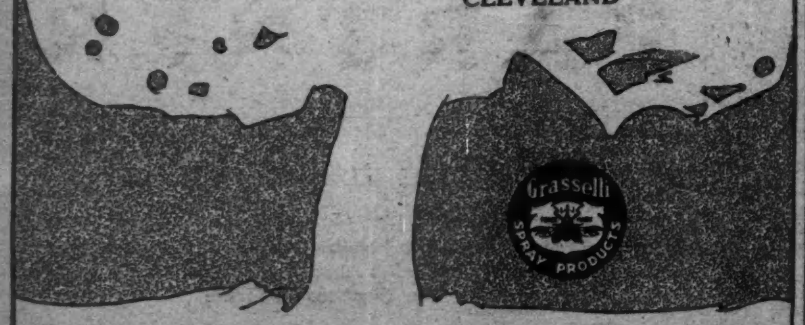


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# Flowers Make Homes of Houses

By Mary Lee Adams

A HOUSE may be small and unpretentious, lacking in architectural beauty, but if we see flowers about it, we know that it is a home. Nature has been kind to us orchardists, for the thing we live by—the orchard, is in itself beautiful, yet nature still prefers to help those who help themselves, and her brightest smile is reserved for the home around which flowers bloom.

Now is the time to take down the shovel and the hoe, and to put into practice those gardening dreams with which you lightened the flowerless months. If you are a really first-class dreamer, you can hardly expect the fact to equal the dream, but see how near you can come to it. Unless you live very far north, you must now hasten to prepare beds and borders. Many flowers, notably sweet peas, have as motto "early to bed and early to rise," so if you wish to see them early, plant them early.

### Why We Love March

March isn't a well-mannered month. He blows and he snows. He brawls and he bawls among the bare boughs. He's the most obstreperous youngster on the calendar. If we love him, it is for the promise he brings. As we listen to his jazz-band airs, the wind seems to shout "Can spring be far behind?" We realize that all this hullabaloo is just his uproarious play and that the real business of March, after having his little fling, is to quiet down and warm up in preparation for the sweetest act of his life—the introduction of spring.

Yes spring is at the door. Any day now she may unexpectedly throw it wide open. Indeed, she played that trick on us last year and found a good many unready. Think of it! Unready after the long months of waiting for that very thing. Those who were dilatory then, made firm resolve that never again would they be caught with the flower catalogues not even studied, at a time when every thing should have been under way and a good many things under ground.

### Admire All But Choose Few

A sort of covetous madness possesses us at this season when we succumb to the fascination of the garden catalogues. It is a well-recognized form of intoxication that overtakes the enthusiast who studies them. We act like children on Christmas Eve in a toy store. "Oh Mama! I want this one. And I want that one too. It's prettier. And this one I like best of all. Oh no! I don't either. Here's the loveliest and the best. Why! it's just like the first one I saw, isn't it? Well, anyway I do believe I like the first best."

So we rush round in a circle, greedily and unreasonably snatching at all the toys, not pausing to exercise common sense. It is a good plan to indulge this orgy of imagination by turning all the pages of the catalogue and gloating over every one of the dear things you think you would enjoy. Then steady down to business and cut out all that are beyond your means, beyond your ability to care for them, or outside of your experience.

The catalogue illustrations are perfect beyond any possible realization, like a Book of Beauties of whom the original may not compare with your own Mary Jane. When you add alluring names to these fair enticers, it is hard to withstand them. Descriptive names are more moderate now than they were in one period of garden nomenclature. We may still lean to extravagances like "Superb" or "Enchantress," and to lordly titles such as "Duchess This and Duke of That," but the most reckless would hesitate to cuss a defenceless flower with the name "Welcome-Home-Husband Be-It-Never-So-Late." It must have been a very sentimental and still-hopeful old-maid who bestowed that recorded insult upon a little blossom.

### A Little Well Done Is Best

You who read these lines will do most of the garden work yourself. At best, you will direct your good John as he devotes an afternoon to the heaviest digging. Without the services of a professional gardener, you will have a much better chance of securing the effect you long for, if you are modest and even somewhat utilitarian in your choice. One sturdy clump of well tended blooms, is more rewarding than a long straggling border half-choked with weeds, and showing all too plainly that the langor of summer had overtaken the gardener before the crying needs of the discouraged plants had been attended to.

There's one important point that is often overlooked even by those who show otherwise good taste in the garden. How many times we have seen a crimson rambler wasting its glorious masses of bloom against an outraged red brick wall; snowy lilies obliterated by the white boards behind them; blue flowers lost in the distance. Flowers should be selected with a view to such surroundings as set them off to advantage. Keep this in mind when you scan the pages of that catalogue.

Study the best of all garden books, the wide-open book of nature. What unerring instinct has led her to throw the mingled mantle of white dog-wood blossom and rosy redbud over the soft grey and tender green of the early woods? Why does she reserve her royal purple asters and her golden rod to blend with the stronger tints of autumn? No nursery man can supply you with finer effects than these.

### The Treasure of the Humble

Perennials are the mainstay of the country gardener. Some of the homeliest are the most beautiful and decorative. What could be more picturesque than the clump of hollyhocks by the old stone wall, or the bright row of their high-held heads against the fence or close beside the cottage door?

I made up my mind when I started to talk about flowers that I would not be led away into calling names. It's in questionable taste, and when you begin in the flower world you never know when to stop. After mentioning one, it looks slighting to leave out others equally desirable.

But now that I have broken down on hollyhocks, (a special favorite of mine) I cannot resist passing on to you the picture in my mind of a successful use of iris. The approach to a farm house where I visit, is not improved by a little old building set just where it must be passed close by on the way to the dwelling. But it's useful there, and so, as often happens, an apparent misfortune has been converted into an added charm.

It stands in a tiny hollow, so that it seems the most natural thing in the world for it to be overgrown with vines. That in itself went a long way toward softening its defects. But when it was literally floated onto a sea of iris—purple and white, plain and frilly, tall and lowly, it became a picture, a welcome, an invitation to go yet further up the hill where an answering gleam of white and purple beckoned from the house. It is the one feature that I oftenest hear dwelt upon in speaking of the attraction of the place.

### Flowers Inside the Home and Out

We ordinary people are sometimes rebuked by the owners of the finest sensibilities, that we cannot be satisfied to leave the lovely flowers on their stalks. But most people do enjoy flowers inside the house as well as in the garden. I am heartily among them. A room with a bunch of flowers rightly arranged in the right container, has the best oranment possible. No need to injure the plant when cutting the bloom.

I'd like to call your attention in this connection, to the rather new, inexpensive vases of all sizes and shapes, in a high glaze of every imaginable lovely tint of undecorated china. Wander into a store that has them on display, and in no time you'll see exactly the one—or two—that would precisely blend into a certain spot in your living room and look perfectly adorable with daffodils or pink roses or whatever flower you are going to have at hand to gather this season.

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FIELD FORCE PUMP COMPANY
Dept. B, Elmira, N. Y.
40 Years at Sprayer Building


# Mr. Apple Grower

(*Continued from page 9*)

day among the trees wherever apple growing is practiced as a business. The impression that spraying alone is the only really essential orchard practice, is responsible for many a small crop of fruit. The factors of nutrition and soil health are of the greatest importance in every orchard for securing large yields, and when we have learned the food and care our soil requires we are on the high road to health, wealth, and happiness. This study and practice, however, demands orchard concentration and will tolerate no entangling alliance with a diversity of other crop interests. Yet many of us limit our summer orchard work to the minimum number of sprays and provide no orchard food at all, because of the demands upon men and teams by these other crops.

### Tree Vitality Necessary

Orchard fertilization problems have prompted a wealth of appropriate literature and the grower whose mind and labor are devoted to his trees can profit greatly by experimenting with stimulation of this kind. Vigorous healthy trees and buds result from proper food and treatment and right here is one of the greatest factors of safety for the one-crop man whose business is apple growing, for abundant evidence shows that those vigorous trees that reflect regular care and attention are vastly better able to resist the occasional late spring frosts than are their neglected weak-kneed brethren. Barring the most drastic acts of Providence, the apple grower whose trees are well grown and properly sprayed can look forward with confidence to annual crops.

But how many of us actually play the game thoroughly? Are our expensive power sprayers washed out after the spraying is over, the engines drained, pump valves and seats cleaned and greased, and everything made ship-shape for the next season? Or do we rush the sprayers under cover and, with the honorable intention of fixing them up "next week," hurry off to give some field crop a bit of tardy attention? Why weren't those girdled trees bridge-grafted in time to save them? And those trees here and there with the light foliage, strapping husky trees in stature capable of bearing several hundred dollars worth of fruit—what have we done about them? They are worth a good many acres of corn, or wheat, or hay, and yet the season rushes by with frantic efforts to cultivate this or harvest that, and the timely stitch for the orchard itself is never taken.

Those of us who are engaged in the fascinating but exacting art of raising apples, good apples, should forsake all false gods and concentrate upon this one thing, for here lies the prize that compensates generously for our best thoughts and efforts. There are so many factors involved in the different phases of this industry, that only the grower who possesses constancy to purpose can enjoy those larger rewards that accrue to the man who minds well his own business and who makes a real business of that.


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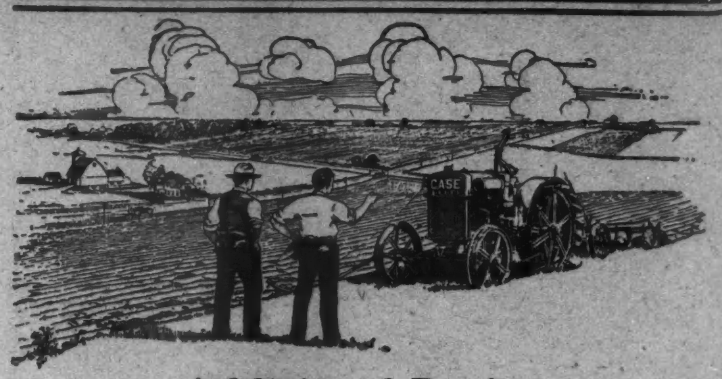

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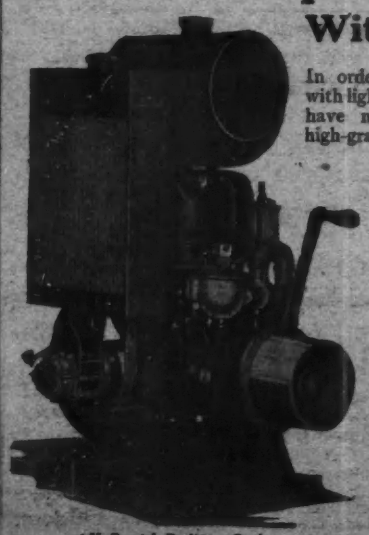

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## The Control of the Strawberry Weevil

By D. V. Rivenburgh

OF LATE years there has been a considerable amount of damage in the strawberry plantings from the so-called strawberry weevil. This damage appears as a cutting off of the blossom bud in the spring just as the terminal cluster starts to swell. The insect causing the damage is a small shiny black beetle that is only seen by the closest observation. This beetle passes the winter in the trash covering the ground and emerges in late April or early May. As the blossom starts to develop, it inserts its eggs in or near the blossom bud and directly below it cuts off the stem so that the bud falls off or droops over from its own weight. This is to kill the bud so that the eggs may hatch unhampered. If the bud was not killed, the rapid expansion of the bud cells would crush the egg imbedded between them.

### Three Year Experiment

In a large planting at Glenco Mills, N. Y., that has been under observation for three years, the insect has been brought under control after former seasons of almost total crop loss. For a number of seasons, the owner as well as many neighbors, attempted to control the beetle by various sprays, none of which were found to be at all effective. In the season of 1919 when three applications of liquid lime-sulphur and arsenate of lead were applied on a patch of seven acres, there was estimated to be a three-quarters loss of the season's crop. In the spring of 1920, the plants were dusted with a mixture of powdered arsenate of lead one part, and powdered sulphur five parts. The first application was made on May 20th when the beetles were fairly numerous and apparently were just starting to do damage. The dust was applied in generous amounts so that the leaf petioles and the developing blossom stems were well covered. At the time of the first application, only a very few of the blossoms were open, the majority still being in a head at the crown of the plant. One week later the beetles again appeared in considerable numbers and the planting was again dusted. The beetles were very scarce after this application. The plants were practically all in blossom.

The following table shows the dusting for three seasons.

| No. of Applications | 1920 | 1921 | 1922 |
|---|---|---|---|
| | 2 | 2 | 3 |

As has been stated before, in 1919 about three-quarters of what averaged a $6,000.00 crop was lost. In 1920, the dust cost $20.00 per acre for five acres, making $100.00, and it cost around $25.00 for the two applications. This made a total cost of the control of $125.00. For that season 750 bushels were marketed from the five acres under supervision and brought a gross return of $6,000.00, comparing very favorably with only one quarter of this amount for the season before. The control secured was very good.

In 1921 with two dusts applied, the results were even more satisfactory. From the five acres 875 bushels brought $7,000.00 with an expenditure of $180.00 for the insecticide and the cost of applying.

In 1922, one patch was dusted twice and another three times. The crop and the expense were practically the same over similar acreages as in the two preceding years.

Of a number of varieties observed, the Glen Mary and Big Joe apparently are those most favored by the beetle. Strangely, too, the beetle seems to select only perfect blossoms.

### Applying the Dust

For applying the dust, a wire muzzle similar to those formerly used on oxen was fitted with a handle made of heavy insulated wire about one-half inch in diameter. This handle was made long enough to bring the bottom of the wire basket thus fashioned about six inches from the ground when held in the hand. The wire was lined with a cheap grade of cheese-cloth. About three pounds of dust was placed in the duster and a man walked slowly up and down the rows of plants giving a slight twirling motion to the duster. The dust shifted out on the plants very nicely by the moving of the basket in an arc of forty-five degrees. The application is made rather heavy so that the plants show up fairly white with the dust.

At first dusting was tried very early in the morning but this several times was not found to be as satisfactory as the plants dusted after the dew had dried. The reason for this was found in that dust settled almost entirely on the leaves and hardly any on the stem and other parts below where the beetle works. Dusting in the forepart of the evening is also very satisfactory. It may well be said that the beetle actually imbibes some of the arsenic when it sips some of the dew which collects later. The whole plan of control however is not based on any arsenical action. If there is any poisoning effect from dusting during the evening, it is purely secondary. The system of control is one of a repellent nature. The beetles apparently are not willing to travel over surfaces that are coated with the dust to lay their eggs. The sulphur is the chief ingredient that repells—the arsenate of lead makes the mixture fluffy in character and permits a great deal better distribution than straight sulphur will.

### Weevil Is Spreading

The weevil is spreading more and more into the strawberry acreages and even now many times is not credited with the damage that it is really doing. This system of control described is one which has certainly proven very successful and in addition is one which any grower, whether the acreage be large or small, can easily adopt without any outlay except for materials and labor. The sulphur and arsenate may be easily purchased in any amounts and mixed by hand. Two men can dust five acres in one day easily. Liberal amounts should be applied as careless dusting means considerable. The man who has had the most experience with the dust in a commercial way places this difference at $300.00 per acre.

The best direction that can be given is to watch the plants carefully in May for the signs of the beetle's work and for the bugs themselves. Directly that these have become numerous, usually about a week after first noting them, apply a good heavy dust. If a rain comes within the next two to three days, dust again. Keep plants well dusted until in full blossom. About ten days after the first dust or when beetles again begin to appear, apply another application. A third may or may not be needed, depending on the rapidity of the season.

## Pecan Scab

Clemson College, Sept.—. The Botany Division has received a number of specimens and inquiries concerning pecan scab, which is distributed throughout the region of pecan culture and in many places is destructive. It can be recognized by the brown spots which are produced on leaves and nuts. The spots usually have quite definite borders, but early in the season they are apt to drop off before maturity. Later infections are apt to cause the nuts to be undersized and faulty.

## Gophers

POCKET gophers are frequently very bad in orchards. They will feed upon the tender roots, in fact, will cut off the entire root system so that one can pull the tree right out of the ground and often find that the main root has been chewed to a sharp point. Root vegetables, sweet potatoes, carrots, raisins, etc., poisoned with strychnin and placed in their runways will generally give good results. Frequently gophers can be drowned out where irrigation water is available.

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The best of every variety—from whole roots—properly matured.

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# Diseases and Insects Attacking the Pear

IMMEDIATELY on thinking of the pear one's attention centers on fire blight, the most dreaded disease attacking this fruit. Space will not allow us to go into details concerning the handling of this disease in this issue. We have already had several articles in recent months on fire blight control and we have others in preparation at the present time.

Perhaps the second most serious enemy of the pear is the pear scab. In numerous tables in this issue reference has been made to pear scab and treatments are recommended. We wish to urge upon growers, however, to watch pear scab very carefully, especially in its early stages. The scab will attack many varieties of pears about the time they are in bloom, will often produce a sort of twig blight somewhat resembling the fire blight and will destroy practically the entire crop before the grower knows what the trouble is. For infections such as the scab and especially in those sections which have the right climatic conditions for the development of this disease, spraying starts very early and by all means, the delayed dormant and pink sprays should be given. Later one will often note that the scab will start on the underside of the leaf and in a few days the disease will begin to form ugly patches on the fruit, which will mean that the crop will ultimately be ruined unless it is carefully checked.

The codling moth is also quite troublesome in some sections on pears. It can be fairly easily controlled, however, as is shown in our various spray schedules in this issue.

### Blister Mite

Blister mite is fairly easy to control but nevertheless at times it is quite a serious insect. The first appearance of the attack of this insect is shown in the early spring when the new growing shoots and fall unfolding leaves take on a reddish green color, having raised blistered patches of a reddish tinge. Later as the leaves become normal in size these patches spread pretty well over the leaves and turn dark brown to black and also gradually increase in size as the season progresses. The leaves become more or less distorted. The under surface of the leaves will have galls which are dark in color and corky in texture. The insect also attacks the fruit, lodging at the stem and forming blisters on the stems and fruit, first brilliant in color and later becoming dark. The stems will grow unusually large and the fruit will become malformed. Occasionally this insect also attacks the apple. The insect or mite which produces this attack is microscopic in size. It becomes very active in the early spring. Where good lime sulphur spraying is done, especially in late winter, very little trouble can be met in controlling this insect. The strength to use is about 9-100. Great care must be used to cover the tree thoroughly and especially cover well the ends of the branches. Also where the attack has been very severe an autumn spray of lime sulphur is good, also the oil emulsion sprays are very helpful.

### The Slug

In June and again in August, there is often a slimy insect appearing on the surface of the leaves of pears and cherries. This insect works rapidly and grows fast, consuming the leaf as it goes along, finally leaving nothing but a skeleton of the leaf. In the distance the tree looks very brown, as though a fire perhaps had passed over it. The insect devitalizes the tree by stopping the functioning of the leaves, weakens the buds and if not kept in check it will eventually have a marked effect upon the vitality of the tree. Fortunately this insect is very easy to control. Any finely divided dust which can be thrown on its body will dry up the body and destroy the insect; or one can spray with lead arsenate, dry, at the rate of 1 pound to

(*Continued on page 42*)

# Magic

## Lies in pretty teeth—Remove that film

Why will any man or woman in these days have dingy film on teeth?

There is now a way to end it. Millions of people employ it. You can see the results in glistening teeth everywhere you look.

This is to offer a ten-day test, to show you how to beautify the teeth,

### Film is cloudy

Film is that viscous coat you feel. It clings to the teeth, enters crevices and stays. When left it forms the basis of tartar. Teeth look discolored more or less.

But film does more. It causes most tooth troubles. It holds food substances which ferment and form acid. It holds the acid in contact with the teeth to cause decay.

Germs breed by millions in it. They, with tartar, are the chief cause of pyorrhea.

### You leave it

Old ways of brushing leave much of that film intact. It dims the teeth and, night and day, threatens serious damage. That's why so many well-brushed teeth discolor and decay. Tooth troubles have been constantly increasing. So dental science has been seeking ways to fight that film. Two effective methods have been found. They mean so much that leading dentists the world over now advise them.

A new-type tooth paste has been perfected, correcting some old mistakes. These two film combatants are embodied in it. The name is Pepsodent, and by its use millions now combat that film.

### Two other foes

It also fights two other foes of teeth. It multiplies the starch digestant in the saliva. To digest starch deposits on teeth which may otherwise cling and form acids.

It multiplies the alkalinity of the saliva. To neutralize mouth acids which cause tooth decay.

Thus Pepsodent brings to people new conceptions of clean teeth.

### Lives Altered

Whole lives may be altered by this better tooth protection. Dentists now advise that children use Pepsodent from the time the first tooth appears. It will mean a new dental era.

The way to know this is to send the coupon for a 10-Day Tube. Note how clean the teeth feel after using. Mark the absence of the viscous film. See how teeth whiten as the film-coats disappear.

See and feel the new effects, then read the reasons in the book we send.

If you count such things important, cut out the coupon now.

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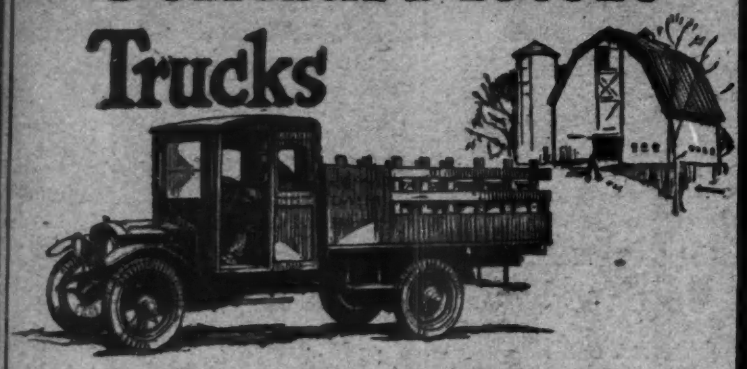

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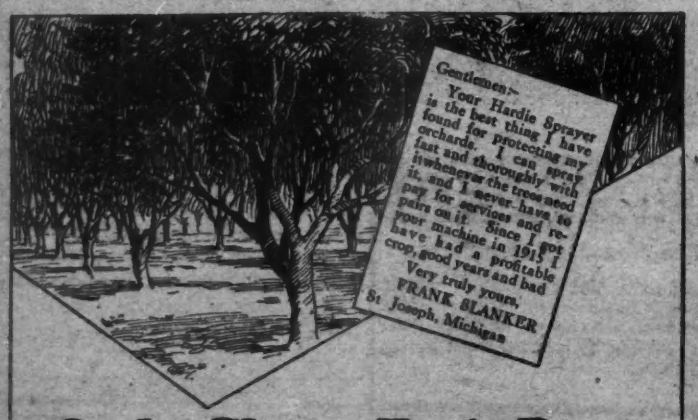
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# Gooseberries as Money Makers

By I. T. Pickford

THE gooseberry is rather particular about the place where it thrives, which may explain why one-half of the commercial crop of the country is produced in Michigan, and one-half of the Wolverine crop in Oceana and Newaygo counties.

According to such figures the area of gooseberry supply must be quite limited. With a healthy demand and limited supply the business ought to be fairly remunerative. In order to find out about this I went to some of the canning factory managers. Among the questions I asked them were: Do you have a good demand for canned gooseberries? In what size can does the trade want them and in water or syrup? About how much do the berries yield per acre? Could you recommend that more acreage be planted? Similar questions were asked of several growers, especially regarding yield.

G. E. Rollins of the W. R. Roach factory at Hart did not hesitate a bit about being able to dispose of the crop very handily. He was sure they could sell all they could produce and says the company plans to set ten acres on their own farms. A big New York jobber takes most of their annual output of which the largest portion is solid packed in No. 10 gallon cans without sugar. A limited amount is packed in No. 2 cans with a 50 degree syrup.

### The Market Demand

The principal demand for the big cans is by the baking concerns and no doubt goes chiefly into pies. Mr. Rollins however believes that the fancy article in the No. 2 can is promising for future trade development.

Harold Royal of the Oceana Canning Co. at Shelby reported the same except that most of their product goes to mid-western cities. It looks as though people like gooseberry pie in spite of all its reputation for a sour disposition.

Taking the figures of amounts received each year by the Oceana and Newaygo factories it appears that an average production of gooseberries for the two counties is at least 200,000 pounds. It is probably more, as some are shipped out in the fresh state. Opinions vary relative to the amount an acre normally yields. Set 6 feet by 6 feet there are 1,210 bushes per acre and 4 to 5 pounds per bush would not be unreasonable for large healthy plants. This is too high an estimate, however, as the figures from both growers and factories indicate about one ton per acre as the average from mature plantings. Based on such yields there are more than 100 acres of gooseberry patches in the two counties.

### Varieties to Plant

Gooseberries belong to the Saxifrage family of plants and the American and English varieties are different species. The leading American variety is the Downing. Canners prefer it to the Houghton. English sorts like Columbus are very large, but mildew so badly that it makes their culture too hazardous for commercial growers.

Gooseberries, like currants, thrive best in a deep moist loamy soil. This does not mean a soggy undrained location. A fairly moderate humid climate suits them better than dry intense heat. In this region they can be found growing on many types of soil, even light sand and heavy clay.

Cuttings of this plant root quite freely. Of course you can buy well-rooted plants from nurserymen, but if you want to grow your own, take six inch cuttings in the fall of mature wood of the current season's growth. These can be immediately planted in rows about 30 inches apart and spaced about 6 to 8 inches or more in the row. Mulch well with straw during the winter. Put two-thirds of the cutting down into the soil. They will develop root systems the following year and can be transplanted to the field or allowed to remain in the row another year if some of the plants are thinned out.

### Need Plenty of Room

To facilitate cultivation and spraying it is doubtful if it pays to set closer than six feet each way. Skillful growers have been successful with gooseberries planted between trees of a young orchard. Needless to say failure follows such a plan if careless attention is paid to fertilization and cultivation.

It is almost imperative that intensive cultivation be practiced. Lack of moisture and foul growths soon ruin a neglected patch. Cover crops can be used to advantage, especially a crop like oats, barley or spring rye which winter kills and then works into the soil easily with early cultivation.

One trouble during the growing season is a sort of drying up around the edge of the leaves and premature defoliation. Experiments with fertilizer this past season indicate that plenty of available nitrogen is a good preventative. Ammonium Sulphate applied early at the rate of ¼ to ½ pound per bush held the leaves and they were larger and a healthier color.

Workmen by mistake put this material on a few bushes in the field belonging to Geo. Hawley, president of the Michigan Horticultural Society, and Mr. Hawley took pleasure in taking visitors to note the wonderfully noticeable improvement in these plants as compared with those surrounding them.

James Billings treated certain rows and a blind man could almost feel the difference in vigor.

Pruning consists in cutting out a few of the oldest canes each year and allowing an equal number of new ones to remain. The best berries are borne on shoots 2 to 4 years old.

### Dusting and Spraying

Examine the bushes for scale insects. If they are found the ordinary dormant application of lime-sulphur or other scale killing spray must be made. For summer spraying bordeaux is better than lime-sulphur. To control mildew and leaf-spots apply bordeaux when the leaves are nearly all out and again when the fruit is one-fourth grown. If worms are present, add dry lead-arsenate at rate of one pound to fifty gallons of the above mentioned bordeaux. When the fruit is past half-grown use white hellbore if worms are still troublesome. Use it at the rate of ½ ounce to each gallon of water. Gooseberry diseases and insect pests (excepting scale) can also be controlled, it is reasonable to expect, with the improved dusting machinery and dusts which are now on the market. Sucking insects like aphids must be treated with contact insecticides like nicotine-sulphate.

Coming to the subject of harvesting it should be said that the time of picking gooseberries recommends them in this country. That is, they come early fitting in quite satisfactorily between strawberries and cherries. Growers like to hold their pickers and also like to have the money coming along steadily.

Growers got eight cents per pound this year which is higher than usual. The pickers ordinarily wear gloves and strip the berries from the stems. Sticks and leaves are removed by running through a fanning mill of the common sort used for cleaning grain.

The berries can be handled much more easily than most fruits. They do not spoil quickly and do not bruise when hauled in bushel baskets or lug-boxes. Probably most every one knows that they are picked while still green. The ripe berries develop a good flavor and make good jam, but the commercial trade does not seem to demand anything but the tart green berry.

In closing, this little story about gooseberries it should be said that no one is recommending a headlong rush into the gooseberry business. It has a place and a good place, which can be developed still larger.

# Problems in Pennsylvania Fruit Growing

By S. W. Fletcher

THE strictly commercial apple industry of Pennsylvania is hardly twenty-five years old, and the peach industry even less. More than half of our apple orchards are not yet bearing. Our orchard management practice is still in the formative period; it has not yet become a system, as in Western New York. Pennsylvania fruit growing is mainly retail. Only in a few counties will there be any considerable development of carlot shipping. Scarcely 10 per cent of Pennsylvania fruit pays toll to the commission man. We shall never be a great shipping state; it may comfort you to know that about the only competition we are likely to give Massachusetts growers will be in supplying 8,000,000 people, in our own 500 local markets, in case you should ever want to ship to them.

### Problems Cultural and Marketing

I regret to report that our old friend, the Baldwin, is failing rapidly. Once the king of fruits in Pennsylvania, it is now being displaced by the Stayman, McIntosh and several other sorts. The severe winter of 1917 gave it a sharp set-back; some trees were killed outright and many more had their lower branches killed. Added to this is the trouble with Baldwin Spot, or Bitter Pit, especially on fruit in common storage. It has been a shy bearer in recent years. Baldwin will continue to be a favorite in northern and western Pennsylvania but it has lost its grip, and now yields first place in the pomology of the state to Stayman.

We witness without regret, however, the passing of the Ben Davis. It is a shipping variety and has no place in the fruit list of a state that grows apples chiefly for local markets and hence must have sorts that are fit to eat. Delicious is making new friends every year. Notwithstanding its defects, such as marked susceptibility to scab, a tendency to mould at the core, a loss of flavor or "flattening out" in cold storage, and sometimes lack of size, it has proved to be a vigorous, hardy, early bearing, and productive variety of high quality and seems to be especially valuable for keeping in common storage for local markets.

### Standardize Varieties

One of our problems is the standardization of varieties. We grow entirely too many sorts. Commercial orchards with twenty-five or more varieties are the rule, rather than the exception. Much progress has been made in this direction the past few years. It is a fair estimate that at least seventy-five per cent of the commercial apple planting in Pennsylvania under ten years old is of twelve standard sorts: Baldwin, Grimes, Jonathan, McIntosh, Rome, Spy, Stayman, Stark, Wealthy, York, Smoke- at least seventy-five per cent of the commercial peach planting is of eight standard sorts: Belle of Georgia, Carmen, Elberta, Greensboro, Hiley, Iron Mountain, Salway, Smock. The reduction in the number of varieties for commercial planting has proceeded about as far as it ought to go, in Pennsylvania. The great diversity of cultural conditions and the different preference of our numerous local markets, make it desirable to plant more of varieties that are of distinct local adaptation, and less of the great cosmopolitan sorts, that are most satisfactory in the wholesale districts.

### Sod Orchards

Pennsylvania is a state of sod apple orchards. Fully 95 per cent of our small semi-commercial farm orchards of one to four acres are in sod and pasture and at least 50 per cent of our strictly commercial orchards are in sod mulch. When I went to Pennsylvania from Virginia, six years ago, I could see no excuse for a real commercial apple grower having a sod orchard except on steep or rocky land which could not be tilled anyhow. I have changed my mind. Thousands of acres of the most successful apple orchards in the state are in permanent sod on tillable land. Undoubtedly this is due, in part, to the fact that we have an average rainfall annually of 45 inches which is well distributed. I am now convinced that a very large proportion of our orchards can be handled in sod to best advantage under the following conditions: The trees must be mature, not young; the land must be strong enough to produce a good growth of grass; the grass must be cut at least twice a year and left as a mulch; the orchard must be fertilized more heavily than tilled orchards and especially with nitrogenous fertilizer; and the mice must be circumvented in one way or another.

### Alfalfa Growing Successful

One of the most interesting developments, in recent years, is the growing appreciation of alfalfa as a permanent inter-crop in apple orchards. Several of our best orchards have been in alfalfa since they were planted, and never have been tilled. The mice seldom bother an alfalfa orchard, unless it has begun to get grassy. On land that takes alfalfa without heavy expense—and not all soils will do this—it is one of the most satisfactory methods.

The problem of fertilizing the orchard is inseparable from the tillage practice. Fertilizers do not pay in Pennsylvania orchards that have annual tillage and cover crops. But it does pay to fertilize sod orchards.

A majority of our best growers now do practically no pruning after the trees are three years old except to cut out suckers, but wait until the trees come into regular bearing before beginning to thin the top. This of course does not apply to peaches.

### Spraying Practice

The controversy on spraying as compared with dusting has been spirited in Pennsylvania. There does not seem to be a disposition to abandon spraying in favor of dusting. The experience of our growers is that dusting may be even superior to spraying for the summer treatment of peaches, and may be useful as a supplement to spraying in the summer treatment of large apple orchards, especially the petal-fall treatment; but few care to go beyond that at present. In fact, house, Yellow Transparent; and that there has been a distinct reaction from dusting apples the past two years, largely because of its failure to control scab. Some growers have abandoned it entirely. But it is natural to expect that dusting methods will be improved; the last word has not been said.

So many cases af spray burning have followed the use of the gun that many of our growers have gone back to the rod except for the dormant treatment; yet the gun was the salvation of many crops during the labor shortage of war times. The last two years of short crops have induced many growers to take a chance, and neglect spraying. This year they are reaping the harvest in a million dollar loss from scab.

You have gypsy and brown tail moths; we have the Japanese beetle which is fully as devastating. If we are as fortunate in keeping it under control as you have been with your pests, our growers will be satisfied. It is progressing several miles a year, with no bright prospect for control, unless it may be from the recently imported natural enemies, but we r- fuse to get panicky.

### More Storage Needed

One of the outstanding needs of Pennsylvania apple growing today is more and better common storage houses. With over 50 per cent of our apples being carried to local markets in motor trucks the problem of feeding the crop to these markets over a long season, rather than flooking them in the fall, becomes paramount.

Our apple growers are in danger of over-specializing. A large proportion of them have no considerable source of income except from apples. Comparatively few are able to survive two successive lean years as in 1920 and 1921, without serious discomfort.

(Continued on page 39)


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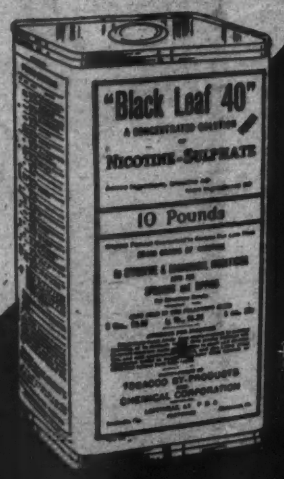


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While you are spraying for scale, scab and other pests, just remember that the specific for Aphis and those other soft-bodied insects is "Black Leaf 40." Use it with any other solution, and make one spraying do double duty.

"Black Leaf 40" is the "old Reliable" for Aphis, Leaf Hopper, Red Bug and a host of other orchard pests that Lime-Sulphur and Arsenical sprays do not control. Costs only a few cents a tree.

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"Black Leaf 40"

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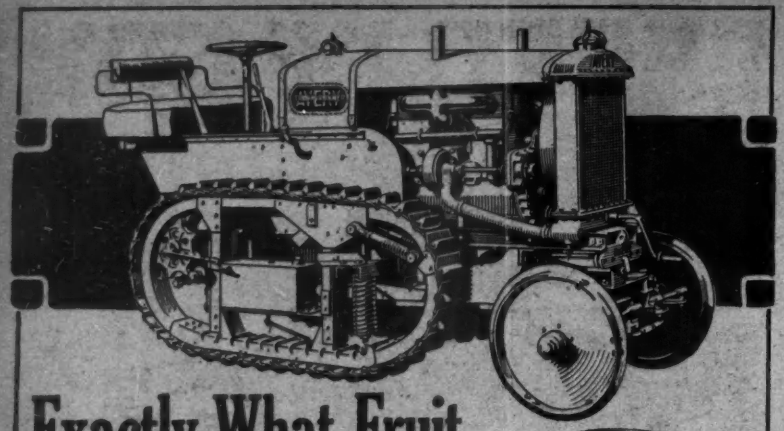

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Avery Motor Trucks are made in any style and size of body to meet your needs.

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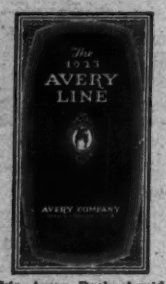


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# The Future of Orcharding

By C. E. Rogers

"THE prospects for the orchard business in Missouri never looked better than they do now," declared T. J. Talbert, recently appointed head of the department of horticulture, University of Missouri, after a tour of the orchard region of the state. Professor Talbert will sever his connection with the Kansas State Agricultural college where he has been superintendent of institutes and extension schools since December, 1919, and will go to Missouri September 1. He is a native of Missouri and a graduate of the University of Missouri in which institution he also took his master's degree. Speaking of orchard conditions in the state, Professor Talbert continued:

"The history of the enterprise combines with all the factors which should be considered in a study of the outlook to make the prospects for the future look very bright.

"Commercial production in the United States may increase to some extent in the next few years, due to increased plantings in such regions as the Shenandoah-Cumberland and the Pacific Northwest. We cannot, however, reasonably expect anything like such increases in commercial production as were experienced from 1905 to 1920. On the other hand, we know that there has not been any concerted effort on the part of the growers in any of the big apple producing sections to materially increase their plantings in the past ten years.

### Number of Bearing Trees

"In fact, the decrease in the number of apple trees as given by the 1920 census is little less than startling even to those who have made a careful study of the situation. The number of bearing apple trees in the United States in 1920 was 115,265,029 as compared with 151,322,840 in 1910, a decrease of 36,057,811 or 23.8 per cent. The number of trees which have not come into bearing or young trees which have not yet reached the bearing age is given as 36,171,604 as compared with 65,791,848 in 1910. These figures show a decrease of 29,620,244 or 45 per cent.

"The number of bearing peach trees in 1920 was 65,654,921 as compared with 94,506,657 in 1910; a decrease of 28,851,763 trees or 30.5 per cent. Those not yet of bearing age in 1920 numbered 21,623,657 as compared with 42,266,243 in 1910, representing a decrease of 20,642,586 trees or 48.8 per cent."

A comparison of the number of bearing and non-bearing trees of Missouri in 1910 and 1920 with those of two other central states was illustrated by Professor Talbert with the accompanying table:

| | Trees Bearing | | Per Cent | Trees Not Bearing | | Per Cent |
|---|---|---|---|---|---|---|
| | 1920 | 1910 | Decrease | | | Decrease |
| Missouri | 5,162,859 | 14,359,673 | 91.0 | 1,565,823 | 3,624,833 | 56.2 |
| Indiana | 3,427,816 | 5,764,821 | 40.5 | 929,160 | 1,961,974 | 52.6 |
| Illinois | 5,112,866 | 9,900,627 | 48.3 | 1,825,886 | 2,548,301 | 28.3 |

"With a 10 per cent increase in population and new export channels opening up each year there would seem to be no danger of over-production for many years," Professor Talbert continued.

### Price Unstable

"There is less stability in the price of apples than in many other products as the product does not respond quickly to the law of supply and demand. It requires several years (12-15) for trees to come into full bearing and overproduction may not be felt for a considerable period.

"The history of apple production in the United States has run in cycles. About the middle of the past century, when apples first began to be grown commercially, prices were good. From 1865 to 1875 prices continued high. Over-production began to be felt about 1880. From this time on commercial production increased and prices fell until 1896.

"From 1890 to 1896 many growers pulled their trees, confident that the good prices would never return. Very little planting was undertaken in this period.

"About fifteen years later the prices began to come back and the crest of another wave was reached between 1907 and 1911. When prices began to improve, beginning in 1900 and continuing up until 1908-09, there occurred another heavy planting period. The planting was so great in many western states that the business assumed the proportions of a boom. Several failures in the Ozarks (Missouri) stimulated prices and the planting of orchards in the northwest.

"With the same rate of increase we will have in 1930 about 130,000,000 people, while in 1940, when many young orchards will be reaching their maximum bearing period, we will have at this rate 165,000,000 people and in 1950, 210,000,000.

"The drift of our people toward the city is distinctly in the orchardist's favor. This should be one of the greatest influences against over-production.

"Judicious advertising and educational campaigns will increase the consumption of apples. Apples of better grade and quality are of importance in this undertaking We can no doubt profit by the educational and advertising campaigns which have been waged for the citrus fruits.

### Export Possibility

"There are great possibilities in export trade, South America as yet is a market undeveloped. Most of the world's commercial apple crop is produced in the United States. The apple is one of the least perishable of fruits and at the same time one of the most popular when a demand is stimulated. At present England is the leading export market.

"The extension of storage facilities and better methods of distribution represent one of the favorable factors in the outlook for the commercial apple industry.

"With improved roads and shipping facilities, distance from market and inaccessibility will be largely overcome. This should make for distinct development in the industry.

"It is important to note that there has been little effort on the part of the growers in any part of the United States to make large plantings. This lack of plantings cannot fail to have effect upon the production in the next two decades.

"If for no other reason than the magnitude of the fruit industry, horticulture should have a prominent place as one of the chief industries of the state. Aside from its magnitude, there is another reason why horticulture should loom large in the eyes of everyone interested in the land and its products—the fact that horticulture has always stood for the highest type of agriculture. Whenever and wherever civilization has been at its highest, horticulture has occupied a prominent place.

"Fruit growing is a specialized business and to the person who will give it the attention which it justly deserves there is an ample reward. What we need is not necessarily more orchards but better orchards. If the grower is to succeed in the future he must give the industry more thought and attention. He must adopt the better methods and practices which have been tried and proven.

### Urges Growers Diversify

"Careful studies in farm management made at many colleges and experiment stations throughout the country have shown that increased acre yields are associated with profitable production and that diversified farming is associated with profitable production. It would seem advisable, therefore, for the fruit grower to increase his acre yields by more efficient care and management. In so doing he would make orcharding his major farming project but he would carry along with this other lines of farming like dairying, poultry raising and the like.

"The experience of the fruit grower of western New York and other sec-

(*Continued on page 45*)

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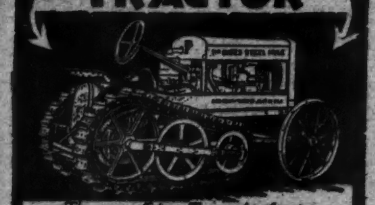

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SteelMule
CAN PULL 6 PLOWS

but 3 plows at a fast speed is the factory Guarantee.

An Ideal Tractor for Fitting. It's Crawler Traction prevents slipping, miring or packing of the soil.

STEEL MULE owners do more acres per day at less cost than any of their neighbors.

*Write for new catalogue today.*

Bates Machine & Tractor Co.
1348 Boston Street, Joliet, Illinois

Free for Testing

A pair of marvelous Everbearing Strawberry Plants FREE! If you will report your success with them. Will bear loads of big red berries the same season plants are set. We have been breeding Everbearing Strawberries for 18 years and have counted 400 berries, ripe and blossoms on a single plant in September. A total yield of 300 bushels per acre is easily possible. Runnerless new MOUNT ARBOR POP CORN and 10 other of Hardy PERENNIAL FLOWERS with—send for a Ribbon Poppy and Catalog. Also our exclusive of Early WHITE SPINE BEET—pronounced Queen in the good measure. Send 10 cents for mailing and expense or not, as you please. Write today and get acquainted with our "Specialties." Also Seeds for Garden, Lawn, Everlasting Flowers, etc. THE GARDEN NURSERY COMPANY, Nurserymen and Seedsmen, Box 217, Osage, Iowa.

One dozen genuine Progressive Everbearing Strawberry Plants mailed at proper planting time for 40c or four dozen for 75c if ordered NOW direct from this advertisement.

Large Income from CHAMPION EVERBEARING STRAWBERRY
The originator of this new everbearing strawberry broke the record for large incomes. It produces much larger crops than Progressive. Some report a yield twice as large. Our stock direct from introducer and we guarantee them to be genuine Champion plants. A limit of 600 plants. Place your order now. 25 plants $1.00; 50, $1.75; 100, $3.00; 250, $6.00; 500, $10.00 if ordered from this advertisement. Our FREE Berry Book tells more about our Fruit Plants.

St. Joseph Nursery, 1203 Main St., St. Joseph, Mich

The BERLIN Quart

The White Basket

That secures highest prices for your fruit. Write for 1923 catalog showing our complete line and secure your baskets and crates at WINTER DISCOUNTS

The Berlin Fruit Box Co.
Berlin Heights, O.


# Pennsylvania Fruit Growing

(*Continued from page 37*)

We youngsters in the fruit business should learn a lesson from our elders in other states. The lamp of their experience burns brightly beneath the adage, "Don't put all your eggs in one basket." If Missouri had heeded this warning, she would not be in such a humiliating position today, with a loss of 11,000,000 trees in ten years. If Washington had heeded this warning, she would not have been down in the depths in 1920, riding the crest of an evanescent boom in 1921, and facing an inevitable decline in the years to come. If the wholesale apple district of southern Pennsylvania does not heed this warning, the enumerators of the fifteenth and sixteenth census will find many abandoned orchards and our prospective supremacy in the apple industry will pass into other hands. It is certain that the type of orchard that should prevail here is not the one so commonly seen now,—a farm of 50 or more acres of apples and little else; but a farm on which apples are the major source of income and the chief object of care, but with enough other kinds of fruit, farm crops or live stock to carry the enterprise over the lean fruit years.

The outstanding need of local market fruit growing in Pennsylvania is better grading.

The progress of Pennsylvania apple growers toward a standardized pack will be greatly stimulated by the proposed Pennsylvania standard apple grades.

### Central Packing House Needed

The proximity of most of our orchards to good markets favors individual rather than cooperative effort, especially in selling.

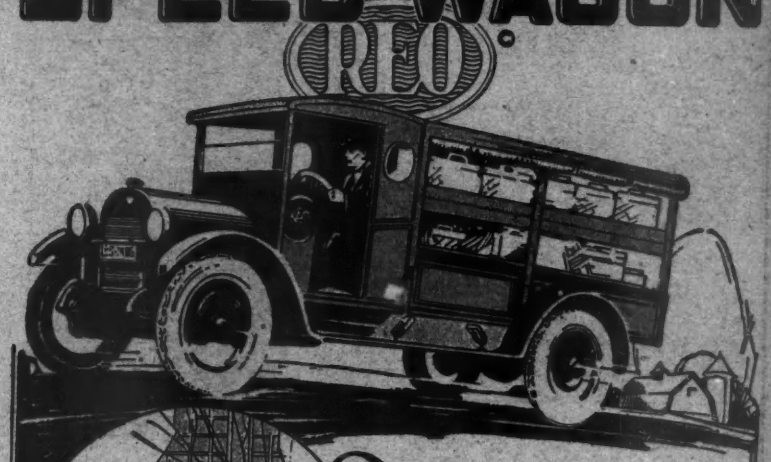
The time has come for a change. The last two years, which have been rather lean years, on the whole, have set the growers to thinking about cooperation. They have observed with interest the success of the central packing house movement in Western New York. Our orchards are larger, and more widely scattered than in Western New York, yet it is evident that there are many places in the wholesale districts where a central packing house is entirely feasible. The central packing house is the next step in the wholesale fruit industry in Pennsylvania, for it is based on the proposition, too long overlooked, that a product must be standardized before it can be merchandized.

On the whole, the last two years have been rather lean ones for Pennsylvania fruit growers, especially for the wholesale men, and the freezes of April, 1922, left many of them desolate still another year. The outlook is bright, but only for the right kind of men. Some of the promoters have been singed. Some of the speculators have been caught. Some of the people who paid big prices for orchards during the year have been taught a lesson. But the real fruit grower, the man whose heart is in his work and who expects to stay in the business for a lifetime, whether the years are fat or lean, can look toward the future with confidence. He will receive a fair return for his labor.—This address delivered at Farmers' Week at The Mass. Agri'l College.

## Powdery-Mildew

THIS is less troublesome than the downy-mildew. In parts of the Pacific Coast, however, this disease becomes very serious, in fact, in some districts on the Pacific Coast it has made it practically impossible to grow European varieties of grapes. The portions of the vine attacked have a powdery appearance, having much the appearance that the leaves and shoots would have if they had been scattered with a light grey powder. The disease may attack shoots, leaves and berries. The treatment that we have already recommended for black rot and anthracnose will also control fairly well this disease.


SPEED WAGON
REO



*First at the Market!*

The Speed Wagon gets right to the heart of rural haulage requirements. In design, capacity and operation it's the made-to-order vehicle for farm service. For it combines—

*Fleetness*—which brings the profitable markets nearer, measured by time.

*Power*—for the hills and rough stretches.

*Traction*,—for sand, mud, snow and plowed fields.

*Ruggedness*,—insuring hundreds of thousands of miles of service.

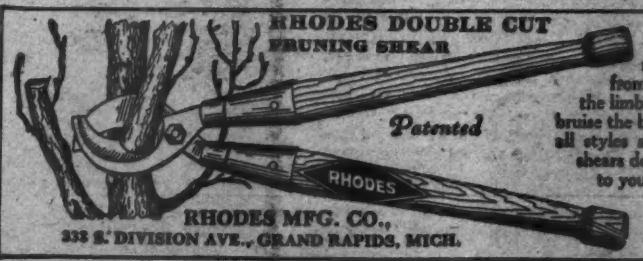
*Economy*,—without a parallel, based on low purchase price, unusually small depreciation, and low running costs.

Manufactured (not assembled) by Reo in its entirety. Supplied in twelve standard body styles,—all convertible. More than 75,000 in use. Capacity 500 to 2500 pounds. Chassis price $1185.

REO MOTOR CAR COMPANY
*Lansing, Michigan*

Delivers the Goods Quicker and Cheaper

RHODES DOUBLE CUT PRUNING SHEAR




THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

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DRY LIME SULPHUR
Produced under our own patents.
Best quality at lowest price.
REX OIL EMULSION
At one-fourth the cost of other oil sprays.
Write us for full information and prices on quantities wanted.
THE TOLEDO REX SPRAY CO., Toledo, Ohio
Makers of the famous *Nuflotform* (Dry Lead Arsenate)

Niagara Orchard Duster at work

Speedy, Easy, Effective, Protection

# Niagara
## DUSTERS and DUST MIXTURES

**Envelope Trees or Plants in a Dust Cloud Reaching all Parts of the Foliage at the rate of 5 acres of Mature Apple Trees or 4 acres of Field crops per hour.**

Get the right Niagara for your farm and save ⅔ of the time and labor ordinarily required in fighting insects and diseases. Dust and you can cover all the trees or crops at just the right time—that means proper protection.

It will pay you to call on the Niagara Dealer or write and find out just what model Duster and what Dusts are best to use on Apples, Peaches, Pears, Potatoes, Hops, Grapes, Strawberries, Celery, Small Fruits, Vegetables, etc.; our specialists are at your service. Get posted on Dusting. It will save your crops and your money.

**Niagara SPRAYER COMPANY**

**Middleport, New York**

*Pioneer Manufacturers of Dusting Machines and Dusting Materials, Soluble Sulphur Compound*

IMPLEMENT DEALERS: Write for Our Plans

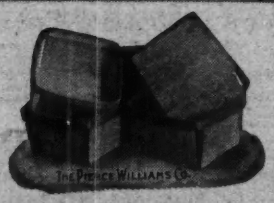
**BOYCE SPRAY GUN**

Just what you have been looking for. The only double nozzle Spray Gun possessing both short and long range. Adaptable for any power spraying, with a capacity of seven gallons per minute and upwards.

One man can handle full capacity of any spray rig with best possible results, saving time and material, and this saves money.

Tested and approved by leading Fruit Growers in all fruit States. Hundreds of voluntary testimonials. $15.00 delivered to all parts of U. S. Parcel Post or Express C. O. D. Satisfaction Guaranteed or money refunded.

**WM. E. BOYCE - Albion, N.Y.**



Baskets for Apples, Peaches, Plums, Grapes, Tomatoes, Cucumbers, Beans, etc. Boxes and Crates for Berries, Cucumbers, Celery, Cauliflower, and vegetables of all kinds.

PLANT BOXES

*Catalog mailed on request*

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**Strawberry Plants.** $3.00 per 1,000

History and valuable illustrated book free. You will learn Address, Mayer's Plant Nursery, Merrill, Mich.

STRAWBERRY PLANTS $3.00 AND UP

Concord grape vines—finest variety. All state inspected and guaranteed. Free booklet.

WESTHAUSER NURSERIES, Sawyer, Michigan

**The Wonderful Burbank Tomato**

Luther Burbank's wonderful genius has created a tomato that from seeds planted in open ground, Bears fruit earlier than plants set out at same time.

Mr. Burbank himself, makes the remarkable statement that "a second crop of tomatoes has been grown from the Seed of the First Crop." A. I. Root, editor of Bee Culture, states that he planted Burbank Tomato Seed when his other tomato plants were budding, yet his first ripe tomatoes came from the Burbank.

Besides being the Earliest Tomato in the World the Burbank is also Blight-Proof, a big bearer, very solid and of fine flavor.

We sold 100,000 packages last year. Send your order today. Pkt. of 40 seeds for 10c; 3 pkts. for 25c; 7 pkts. for 50c or 15 pkts. for $1.00 mailed with Catalog of Seed Novelties.

THE RUNDLE-MURPHY CO., 304 State St., Westport, Conn.

# STRAWBERRY PLANTS

TWO BEST EVERBEARERS, also the new COOPER, LARGEST, SWEETEST and most PRODUCTIVE strawberry known. ONE BERRY makes a BIG MOUTHFUL. 9 berries make a layer in a quart box. 400 crates per acre. Sells for ONE-THIRD more than other varieties on any market. Many other new and leading strawberries, all packed in wire-bound crates, insures safe arrival. BEST varieties of Grapes, Raspberries and other kinds. 31 years of experience in growing and packing plants. Our guarantee protects you and insures your satisfaction with

**WESTON'S TRUE-TO-NAME STOCK**

OUR PRICES have been GREATLY REDUCED. WHOLESALE PRICES quoted on large amounts. Our free catalog shows the COOPER and ten other kinds in their natural colors. Also much valuable information for the grower.

**A. R. WESTON & CO., R. D. No. 1, BRIDGMAN, MICH.**


# Horticultural Digest

INSECTICIDES, Fungicides and Applications is a new book just off the press, written by Professors O. G. Anderson and F. C. Roth of Purdue University.

It has been many years since we have had offered to us a book devoted entirely to spraying. This book will make a special appeal to college and vocational students, employees of spray manufacturing companies, county agents, and many fruit growers, for while the book is written from an instructional point of view, it contains a wealth of material which every orchardist uses. The book is divided into two parts, part one dealing with stomach poisons, contact poisons, fungicides, combination sprays, miscellaneous sprays, fumigants, spraying equipment and cost problems. Practically all spray formulae are included. Part two deals with the control of insects and plant diseases, a study of spray machinery, pumps, valves, special equipment, nozzles, guns, overhead tank system, towers etc., and dusting outfits. The concluding chapters deal with the cost of spraying, spray rings, care of outfits and similar topics. The useful appendix is found dealing with prices of materials, a list of manufacturers of spray equipment and materials, and other topics too numerous to mention.

This book is published by John Wiley & Sons, Inc. of New York and sells for $3.00.

### Horticulture

HORTICULTURE is a text-book for high schools and normals, edited by K. C. Davis of Cornell University. While this book was written primarily as a text, it is so comprehensive, deals with so many subjects, is so clearly and simply written and nicely illustrated that it will prove a handy book for fruit growers to have in their library. If you are interested in the propagation of plants, budding and grafting, in maintaining a fine home garden or home orchard, in knowing something about the enemies which attack our fruits, such as the apple, pear and quince, if you are interested in the fundamentals of growing fruits, such as the peach, pear, plum, grape and the apple, if you are interested in the study of tables and maps showing the distribution of American fruit growing, if you want to know about the growing of sub-tropical fruits such as avocadoes or grape fruit, and if you are interested in maintaining soil fertility, you will be interested in this volume.

It must be understood that each subject treated rather briefly but clearly. This is the second edition and a very attractive text in horticulture. It is sold by the J. B. Lippincott Co. of Philadelphia. Price $1.75.

### Laboratory Manual of Fruit and Vegetable Products

GREAT interest has been shown in the past few years in the development of the horticulture products business. The growth of canneries, juice factories and dehydrators has been phenomenal. In addition, thousands of growers are becoming interested in a small way in canning, juice manufacture and dehydration.

We have had few good text-books and practically no laboratory manuals on this subject. While this book is written primarily as a laboratory manual for college students, it, nevertheless, will be of great interest to those working in manufacturing plants or to fruit growers who are contemplating engaging in the manufacture of horticultural products on a small scale. In addition, there are valuable tables and suggestions which will be helpful to all interested in this phase of horticulture.

Professors W. V. Cruess and A. W. Christie are well-known nationally as leaders in this line of endeavor. They are associated with the University of California. The book is published by the McGraw-Hill Book Co., Inc. of New York and sells for $1.50.

### Wholesale Distribution of Fresh Fruits and Vegetables

WHOLESALERS for some time have been subject to much criticism by the producers, railroads and consumers; in fact, when the middleman is used too often it is confined to the jobber or wholesaler. These men have been accused of being profiteers.

In defence of the industry this book has been published. A survey was made to ascertain the wholesale selling price of representative fresh fruits and vegetables, to ascertain the actual handling cost paid by wholesale dealers, to ascertain other fixed costs, to determine the profits or losses made by the commisson merchants and

The book contains an enormous amount of data of interest to all students in marketing. Statistics showing the total tonnage of fruits and vegetables handled in this country, the tonnage by season, etc. are very interesting. The book closes in giving a general discussion on the wholesale distribution of fruits and vegetables in our leading markets. The authors are R. G. Phillips and Samuel Fraser of the International Apple Shippers' Assn., Rochester, N. Y. The book sells for $5.00.

### Knots, Splices and Rope-Work

THIS is a small, well illustrated, interesting little booklet on how to tie the various knots in handling rope. It takes up such subjects as cordage, simple knots and bends, nooses, loops and mooring knots, shortenings, grommets and selvages, lashings, seizings and splices and fancy knots and ropework.

The book is published by the Norman W. Henley Publishing Co. of New York and sells for $1.00.

"FARM Manufacture of Unfermented Apple Juice" is the title of Farmers' Bulletin No. 1264, published by the U. S. Department of Agriculture. It is a very timely bulletin of some 55 pages which goes into the question of manufacture of cider very thoroughly. Since there is a very large apple crop this year, there is a good opportunity for the manufacturer of ciders and vinegars, and apple growers to be very much interested in securing a copy of this bulletin.

"CULTIVATION and Growing Trees on Texas Farms" is the title of Bulletin No. 293 issued by the Texas Agricultural Experiment Station, College Station, Texas. This bulletin takes up the cultivation and care, not only of the leading fruit trees of Texas but also of the shade and ornamental trees. The bulletin is nicely illustrated and will prove to be very helpful to people considering the growing of fruit and ornamental trees throughout Texas and similar regions.

"COLD Storage as an Aid to the Marketing of Plums" is the title of bulletin No. 344 issued by the University of California, Berkeley, California. This bulletin is very interesting to all plum growers. It gives tables showing the sequence of harvesting and ripening of the leading varieties of plums on the Pacific coast, and in the summary brings out the surprising figures that the Wickson had an optimum storage period of nearly twelve weeks and remained marketable for a week or 10 days after removal from storage; that the Satsuma had a storage period of eleven weeks; that the Kelsey's period of storage was ten weeks and varieties like the Climax, Tragedy and Grand Duke can be kept nine weeks; that the Yellow Egg, Sultan, Beauty, Agen and Sugar will keep well in storage over six weeks and that the Botan, Abundance, Imperial and similar varieties keep in storage five weeks, while the Washington and Columbia deteriorate very rapidy in storage and will only keep about two weeks. Of the varieties of plums tested in storage, the Climax and Tragedy developed the highest quality while the Combination, Peach, Botan, Columbia and German are all of low quality.

**BISSELL** — SPECIAL ORCHARD DUAL-PURPOSE TRACTOR DISC

*A few simple changes makes a double disc* — *In single form*

With trees to right, soil is pulled away and with trees to left, soil is thrown back. Returning on same track leaves soil level as with a **Double Action Harrow**—Disconnect right section and attach behind left and you have a regular **Double Action Harrow—A Real Dual-Purpose.**

**The Handy Control** is equally efficient with disc in either form. There is a **BISSELL** for every tillage need. *Manufactured only by*

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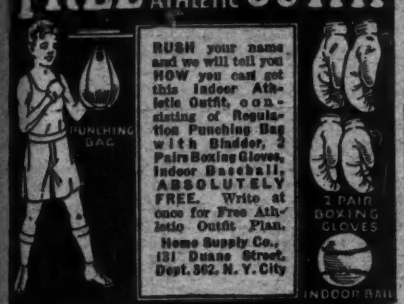


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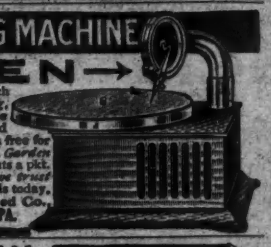

A real machine which reproduces talking, singing and dance music. Guaranteed lots of fun. Given free for selling only 30 pkts. *Garden Spot Seeds* at 10 cents a pkt. *Send no money—we trust you.* Write for seeds today. Lancaster Co. Seed Co., Dept. 2, PARADISE, PA.



**SPECIALLY 6.95 PRICED**

Brand new blue steel, double safety automatics bought before recent tariff raise and offered at special prices for a limited time. Regular $22.00, 25-calibre, 7-shot automatic, 4 1-4 ins. long, our No. 12-2116, special at $6.95. Or regular $25.00 blue steel 32-calibre, 10-shot automatic, 5 in. long, our No. 12-2118, special at $9.75. Both sizes shoot all standard cartridges.

EXTRA MAGAZINE FREE. Rush your order in today and get extra magazine given free with first 500 orders.

PAY POSTMAN ON DELIVERY plus postage.

Money back promptly if Not Satisfied.

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All this jewelry is yours for selling only 6 Purse Assortments at 25 cts. Wonderful for cakes, cuts, burns, etc. Order today. When sold return $1.50 and all 6 Pieces are yours.

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**WHITTEN Strawberries** BRING $ MORE PER CRATE

$100 to $1000 profit per acre. Safeguard against loss, insure larger, better yields. Famous WHITTEN plants are always easy to grow—35 years' experience guarantees healthy, strong, heavy-rooted Strawberry and Asparagus plants. Never failure. Prices reduced. 1923 Catalog. Illustrated in colors. Describes proved and exclusive varieties of Strawberries, Blackberries, Raspberries, Grapevines, etc. Full of valuable information. Tells about "Quick" Keeper of the Colors, and "EATON," the perfect Strawberry that brings you $1.00 more per crate. Learn from experts "How to Get and Grow Berries." Send postal now.

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**Hill's Hardy Tested Sorts**

Best for windbreaks, hedges and lawn planting. Protect buildings, crops, stock, gardens and orchards. Hill's Evergreens are nursery grown and hardy everywhere. Hill's Evergreen book sent free. Write today. Beautiful Evergreen Trees at moderate prices. World's largest growers. Est. 1855.

THE D. HILL NURSERY CO., INC., DUNDEE, ILL., Box 327 Evergreen Specialists



**Rider Agents Wanted**

Select from 44 Styles, colors and sizes of Ranger Bicycles. Ride and exhibit sample Ranger and make money. Deliver free, express prepaid, on Approval.

**12 Months to Pay** On our Ranger if desired. Write today for our marvelous prices and terms.

**Tires** Lamps, horns, wheels, parts, sundries at half usual prices. Save $10 to $20 on your Ranger bicycle.

**Mead Cycle Company** Dept. S, 327 Chicago Write us before you buy. Free catalog.


## Trend in Orcharding

(*Continued from page 8*)

300 pounds pressure. Guns discharging 5-6 gallons per minute should have a fairly coarse opening in the disc. With such an outfit a very large volume of material may be used but which will be broken up sufficiently fine to do most effective work. With a three and one-half horse outfit, only one gun may be employed. Failure to do effective spraying has resulted from the use of an outfit developing 250 pounds or less using the gun with a coarse disc opening. The spray is not properly broken up and does not thoroughly cover fruit and foliage. The coarse spray shoots through the tree passing by both fruit and foliage.

### Thoroughness and Timeliness

Growers have lost large sums by failure to spray thoroughly and timely. Slipshod methods often result in the tops of trees being untouched by spray. This usually is reflected in much wormy fruit. A large tree will require eight gallons of spray or more for best results. Experimental spraying in two orchards demonstrated that the saving of every 21 cents per tree on a season's spraying in material resulted in a loss of $1.04.

Timeliness in spraying requires close observation on the development of insect pests. This is especially so in Codling Moth control. Applications come at definite intervals. This includes the Calyx Spray at which time the poison may be placed in the Calyx cups. Cover sprays are made at the time the broods hatch. Extra sprays may often be necessary.

### Other Problems

Growers are giving strict attention to other problems than these indicated. These include varieties, cooperation and marketing. The planting of apples has reached a low ebb, being mostly confined to replacements in the bearing orchard. Many districts are planting pears. Good prices received for this fruit as compared with apples accounts for this fact. Anjou, Bosc, and Bartlett comprise the main varieties. Low yielding apples are gradually being eliminated. Spitzenberg is a typical example. Winesap, Jonathan, Red Cheek, Delicious, Ortley and other heavy croppers are here to stay.

Cooperative buying and selling is firmly intrenched. All prominent districts have one or more organizations of this kind. The Hood River Apple Grower's Association and the Oregon Growers Cooperative Association are typical examples. Future development will be along the lines of closer cooperation between districts in advertising and selling Northwestern fruit.

The problems confronting Northwestern fruit growers are essentially the same as that obtained in most other fruit sections. They differ only in degree as influenced by local conditions. The degree of success in any section is measured by their ability to cope with such fundamental factors as soil management, pruning, spraying, thinning and cooperative buying and selling. In this respect the Pacific Northwest leads.

**BABY CHICKS**

Hatching every day in the week and every hour in the day. We are the World's Largest Producers.

**Three Million for 1923**

Twelve popular breeds of best thoroughbred stock obtainable, moderately priced; also QUALITY chicks from heavy laying stock at small additional cost.

Smith's Standard Reg. U.S. Pat. Off.

We deliver by parcel post anywhere east of the Rockies and guarantee 95% safe arrival.

Write nearest address, today, for catalog—FREE.

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(Member International Baby Chick Association)

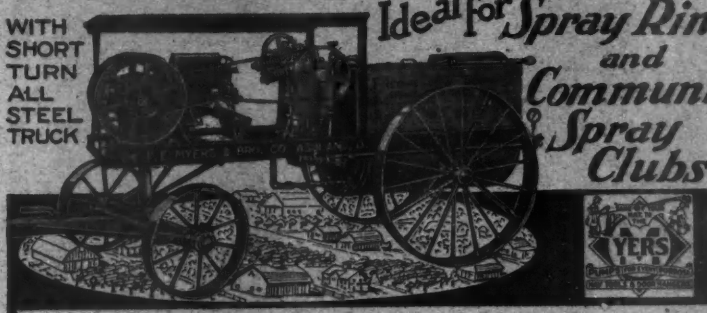
**WEBER'S BEST** laying, **BEST** paying chickens, ducks, geese and turkeys. Fine pure-bred quality. Fowls, Eggs, Incubators all at cost prices. New Catalog and Breeders' Guide Free. W. A. Weber, Box 14, Mankato, Minn.



# MYERS LOW DOWN AUTOMATIC POWER SPRAY RIGS

WITH SHORT TURN ALL STEEL TRUCK

*Ideal for Spray Rings and Community Spray Clubs—*



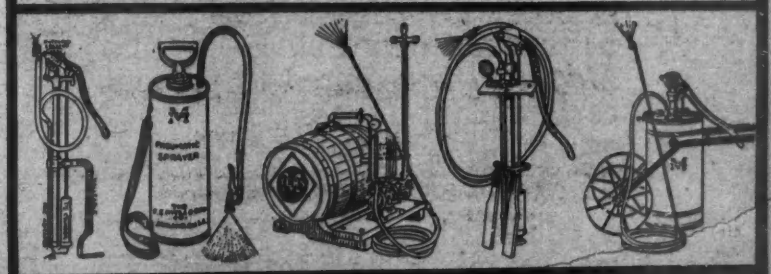

You will better appreciate, when you examine the late styles of **MYERS SPRAY PUMPS,** what experience and modern manufacturing facilities can accomplish in the production of dependable and efficient spray pumps.

If you have extensive orchards to spray, we know **MYERS POWER SPRAY PUMPS, POWER SPRAY OUTFITS** and complete **POWER SPRAY RIGS,** with their many exclusive features, will fulfill your every desire—High pressure, uniform application, capacity, speed, economy in handling mixtures, method of operation, are all satisfactorily and successfully met by Myers Power Spray Pumps—while different styles and sizes permit of a selection for individual requirements.

To those of you who have but a small orchard, a few trees, a garden, flowers, vines, shrubbery or plants to spray, **MYERS BUCKET and BARREL SPRAY PUMPS,** Complete **HANDY OUTFITS** with tanks or cans and with or without trucks, will bring real spraying service. Better constructed, better equipped, they represent the top rung of the ladder in the application of spraying mixtures by hand. And besides, your choice is not limited to one or two styles—the **MYERS** Line has the distinction of being the most complete on the market.

**FREE**—A copy of our new Catalog, No. SP23, showing all styles of Myers Spray Pumps and giving reliable "How and When to Spray" information, will be mailed absolutely free and without obligation to purchase, if you request it.

*And remember, good dealers everywhere sell MYERS SPRAY PUMPS—or can obtain them for you.*

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**Skinner Apple and Peach Sizer**

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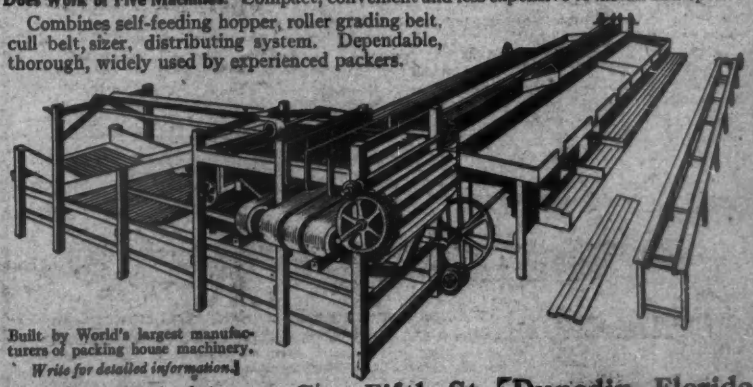

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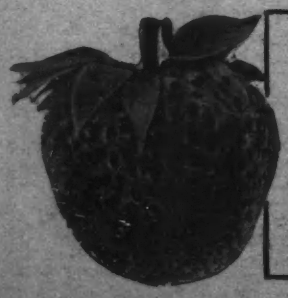

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**The W. F. ALLEN CO.**
138 Market St. Salisbury, Md.

ALLEN'S PLANTS


## Attacking the Pear

(*Continued from page 35*)

50 gallons of water. These sprays should be added whenever the insect appears and if good thorough work is done the majority of the insects will be killed in a relatively short time.

**The Psylla**

There is a small and yellowish flat-bodied sucking insect known as the pear psylla which at times is a very serious insect to control on the pear. It works on the leaves and also on the fruit early in the season. Later the insect develops into a sort of jumping lice. In the honeydue a black fungus will often grow, which gives the bark a rather sooty, yet characteristic appearance. At times there are as many as four broods and when this is the case the disease becomes seriously injurious. Where the psylla has been bad it is well to spray during warm spells in the winter. This might come in December or March. Use nicotine, about three nicotine sprays—about ¾ of a pint to 100 gallons of water. It would be well to add some soap. About 5 pounds of whale oil soap is sometimes added. In order to destroy the egg, it is well to spray the trees before the blossom cluster is separated, using lime sulphur for this spray. After the petals fall, the second spray should be given, consisting of copper sulphate, 2 pounds; powdered arsenate of lead, 2½ pounds; hydrated lime, 30 to 40 pounds; water 100 gallons, and nicotine sulphate, 1 pint.

## Weather Forecasts Save Farmers Money

**Special Service Tells Orchardists When to Spray Fruit Trees—Helps in Harvest Also**

SPECIAL weather forecasts furnished by the weather bureau through the county agricultural agents of the state saved New York farmers sums running well into six figures, according to estimates made by the state agricultural college at Ithaca. The services have been of two kinds, the spray service, furnished to fruit growers to enable them to spray their trees for insect pests and diseases at just the time to be most advantageous, and the harvest forecasts, valuable to all farmers as a guide to cutting of crops.

So greatly have the farmers valued these reports, that the federal department of agriculture has been asked to make provision in next year's budget to enable the work to be conducted on a more extensive scale.

**Eight Counties Got Them**

Forecasts for the spray service were sent to Orleans, Monroe, Wayne, Genesee, Onondaga, Chautauqua, and Ulster Counties. They were used constantly in timing recommendations for sprays. Four of the most important counties had a telephone relay system by means of which it was possible to warn the growers quickly when it was time to apply the spray. This system was used throughout the season whenever occasion demanded. At other times and in counties where the relay system was not used, circular letters and postcards carried the information.

The number of fruit growers reached directly by this service was 2,500. It is known, however, that nearly every grower who received the service had at least one neighbor who got the information from him.

M. C. Hammond, assistant county agricultural agent in Orange County, says that "Farmers in general and fruit growers in particular are greatly benefited by the general use of the weather forecasts. The reports were published by both of the Middletown papers. In the latter part of June, just before the reports stopped coming, we were getting from a dozen to two dozen telephone calles each day asking for the weather report. This in many cases was relayed among neighbors."—N. Y. State College of Agriculture.


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**Chattanooga Nurseries, Box C, Chattanooga, Tenn.**

## New Jersey Develops Lime Sulfur Spray

By E. A. Kirkpatrick

SIX years of tests in New Jersey show that the new form of lime sulfur spray, known as dry mix sulfur lime, is just as good as self-boiled lime sulfur or commercial lime sulfur as a summer fungicide for apples and peaches.

In 1917, New Jersey Agricultural College introduced what was known as a sulfur glue mixture as a summer fungicide. This was used for four years by New Jersey orchardists, but for some reason or another it did not take very well. It was better than self-boiled lime sulfur, however. Last spring the authorities tried to improve this mixture by substituting calcium caseinate for the glue, thus making a dry-mix preparation, one in which ingredients can be mixed dry and the water added later.

The new formula, as used last spring, called for:

8 pounds of superfine sulfur.
4 pounds of hydrated lime.
6 ounces of calcium caseinate.
50 gallons of water.

This year the authorities will recommend eight ounces of calcium caseinate instead of six.

The materials can be mixed dry and stored in boxes or barrels for future use. For this reason the new mixture has been found simple and convenient to use.

In reporting the tests with this new mixture during 1922, Professor A. J. Farley, who developed the new formula, spoke as follows at the meeting of the New Jersey Horticultural Society in Atlantic City:

"Dry mix sulfur lime is the simplest and least troublesome of all summer fungicides. The cost of materials is about the same as for self-boiled lime sulfur, for the year ground sulfur was used. Superfine sulfur gave better results than common ground sulfur however. The use of superfine sulfur is probably not necessary, though for common ground sulfur gave good results.

"The lime used was high-grade finishing lime, the best grade of hydrated lime we could buy. The sulfur was screened through a twelve or fourteen inch mesh screen. Ordinary window screen is all right. All the materials were screened into a barrel and mixed together with a stick. Water was added to make a thin paste. That was one method used. Another method is to wash the dry materials through a strainer into the sprayer tank. This method is all right if the water has force enough to mix the materials. There is not much trouble getting a good mixture because calcium caseinate mixes the sulfur splendidly.

"This new mixture has all the requirements of a good summer fungicide; it is effective, easy to use and safe to use on the foliage. This material was tested in peach orchards at the Seabrook Farms last summer. In one block of trees there was a great deal of scab. This was a good orchard for test. The varieties were early and late. The spray blocks were five rows wide and the data was used from the middle row of the five. In securing the data from the check plot only one row was used. These figures did not give a very good check because there were sprayed trees on both sides of the check row. In other words, the check row was pretty well sprayed.

"A thorough count of fruit at harvesting time was encouraging. Over 18,000 fruits were counted on each plot. The dry mix sulfur lime gave as good or better results than the sulfur glue mixture or self-boiled lime sulfur.

"In the apple orchards where lime was tested for russeting there was not so much rusting as with concentrated lime sulfur.

"We have no data on control of apple scab because the orchards were not scabby. In New York state, however, we saw orchards last summer where check trees had 99 per cent scab and there was no scab on the trees sprayed with the dry mix sulfur lime formula.

"Our recommendations for apples, therefore, are to use the dry mix sulfur lime if you are dissatisfied with self-boiled lime sulfur. If you are getting good results with self-boiled lime sulfur and are satisfied with it, there is no reason for changing. On apple trees use this spray with the petal fall application. It is not intended for earlier sprays.

"On large areas it might be well to buy a mechanical mixer for mixing the dry materials. Some growers have been using them with good results."

## California Peach Blight

ONE of the most serious peach diseases found in California, Oregon and Washington is the California peach blight. This disease is serious because it attacks and kills the buds on the small twigs of the current season's growth. Usually a small canker forms on the twig around the bud that has been killed. Severe gumming will also follow the appearance of these cankers. Often the cankers will run together and will completely girdle a branch. Early in the season these cankers take on a rather characteristic reddish brown color. The fungus at that time will also attack the leaves and the fruit. It produces a typical shothole effect on the leaves and causes a spotting on the fruit. These spots at first are purple and red in color but later they turn brown, will often run together, forming large blotches. Later they will often gum quite badly, having little beads of gum on each spot. This disease works very badly on the bearing wood on the inside of the tree.

If this disease once becomes established in a peach orchard and is not fought, it is only a question of a few years before the entire orchard is ruined. Ordinarily, however, this disease can be fairly easily controlled. Before the heavy rains come on in the fall it is well to spray with Bordeaux, 6-6-50, winter strength. Wherever the peach blight is bad such a spray should be given every year as an insurance against the disease. If the disease has become badly and firmy established, it may be necessary in the early spring to use self boiled lime-sulphur, 8-8-50, about the middle of May. If this does not check the disease another application about the 1st of June is sometimes helpful. Occasionally growers are reporting to use Bordeaux 4-4-50 in the spring successfully, but this spray cannot be recommended unqualifiedly for all conditions. Bordeaux in some districts is a dangerous spray to use on peach trees during the spring and early summer when the trees are active.

## Fire Blight Disinfectant

UP TO comparatively recently it was thought that mercuric chloride or corrosive sublimate at the rate of 1-1,000 would disinfect both cutting tools and wounds in fighting the fire blight. Prof. F. C. Reimer of the Southern Oregon Experiment Station, however, has shown that this is not the case, that while corrosive sublimate or mercuric chloride is a good substance to disinfect the tools it is not very valuable in disinfecting wounds. To disinfect the wounds mercuric cyanide at the strength of 1-500 has proved to be very valuable. He has made hundreds of tests. If one so desires a solution can be made containing both these substances. In that way material will be available for sterilizing both the cutting tools and the wounds.

## Spaniards Picking Lots of Lemons

SPAIN'S citrus crop for 1922 is a good one, ranging from 25 per cent to 30 per cent greater than last year, says Consul Gaston Smith, Malaga, in a report to the Department of Commerce. Great Britain is the principal market for the Malaga citrus crops, but at the present that market is rather indifferent.

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## Gummosis

ALL stone fruits when they tend to bleed more or less form a thick, gummy substance which we commonly refer to as gummosis. This gumming may come from numerous causes. If borers are in the trees down near the ground, or shothole borers are at work in the branches, gumming will take place. Some of the peach diseases have gumming as a typical symptom of such diseases as shothole or California peach blight. Gumming will seem to occur too where there is a stress or a strain in the tree.

There is a form of gumming, however, which attacks the sweet cherry and to which the name gummosis is given, and the Oregon Experiment Station has shown that this disease is largely bacterial. It is so bad that at times entire orchards have been ruined and it is not infrequent to find trees that have two or three of the main branches girdled and killed. The worst time seems to be from the fifth to the tenth year. An orchard which passes the tenth or twelfth year and is kept in pretty good growing condition does not suffer as much as the younger orchards.

The gummosis is peculiar in that it works rapidly in the tree during the dormant time when the tree is not very active. The bacteria get into the sap and work down through the main branches of the tree, working especially in the crotches. They may work badly also around the spurs and buds and may even work in the main trunk of the tree. By late winter or early spring great masses of gum begin to exude from the tree. While gummosis is perhaps worse during winters which are very hard and has some relation in those cases to winter injury, nevertheless it works very badly some years when there is no winter damage of any kind. It works also worse on some varieties than on others. The Bing and the Royal Anne, known in the east as the Napoleon, are very susceptible to the disease, while the Lambert is not nearly as susceptible. Duke cherries are almost immune and the sour cherries are practically not attacked by this form of gummosis.

Nothing can be done in the way of spraying to handle this disease. There are several precautions which can be taken however, which will be helpful. First, do not put cherries on soil where they will have wet feet—put them on soil where there is plenty of moisture for growth but not so much as to give poor drainage conditions. Avoid extremely dry conditions on the one hand or water logged conditions on the other. Work the trunk and main branches of the tree to Mazzard. Grow the Mazzard trees for the first three or four years and then bud the main branches to whatever variety you desire. The Mazzard is more resistant to the disease than is the Mahaleb. Also, keep the trees growing, give them such good care that they make a good annual growth. Where pockets occur badly in the trees, cut them out in late winter or early spring, using a good sharp knife and making clean-cut wounds, wipe out with Bordeaux and Bordeaux paste, the formula of which is given in other articles in this issue. These are all the remedies that are known at the present time. Some day we may know a little more about the true nature of this disease but until we do about all we can do is to double-work the trees, cut out the pockets, use good soil and keep our trees growing.

Where gumming occurs on peach trees, sour cherries and similar fruits, one should at once determine whether or not some other disease is not present or whether borers are working in the trees and take steps to eradicate them. The gumming maybe simply an index of something else working in the tree and may not be much in itself, but it should start the orchardist to at once study his conditions and analyze them very carefully to determine if he might not have some serious disease at work in his tree.

## Sense and Sex

(Continued from page 10)

Wilson (1851), which today seems far removed from the original Wilson, Crescent (1870) and Sharpless (1872), all three of which are still grown extensively in some districts all over Canada and the United States, there are few varieties now in existence that were known fifty years ago. Most of the varieties of the past decade and of today will gradually be superceded by new ones with new names. For our own benefit in the near future and for the sake of posterity, all new varieties henceforth might well be given names that will indicate the sex of the flowers. There would then be both sense and sex in strawberry names.

**BY THEIR NAMES YE SHOULD KNOW THEM!**

| Males with Female Names | Females with Male Names |
|---|---|
| Mrs. Mark Hanna | Mark Hanna |
| Lady Thompson | President |
| Annie Hubach | Oom Paul |
| Glen Mary | Minute Man |
| Malinda | Paul Jones |
| Olivia | Daniel Boone |
| Julia | |
| Ruby | **Females with Female Names** |
| Ella | |
| Jessie | |
| Empress | Nellie Hubach |
| Margaret | Carrie |
| Annie Laurie | Nettie |
| Lady Garrison | Daisy |
| Lady Corneille | Mary |
| | Irene |
| **Males with Male Names** | Maggie |
| | Kittie Rice |
| Senator Dunlap | |
| Captain Jack | **Neuter Names** |
| Uncle Jim | Excelsior (M) |
| Wm. Belt | Klondike (M) |
| Joe | Clyde (M) |
| Williams | Kansas (F) |
| Van Deman | Crescent (F) |
| August Luther | Warfield (F) |

## Future of Orcharding

(Continued from page 38)

tions have shown that to be successful and stay in the fruit business it is necessary to maintain other lines of interest on the farm. These other interests have many times tided the growers over during lean crop years. Perhaps no other factor has caused more abandonment of Ozark orchards than the off crop years. When the grower has no other means of making a living a few bad years may force him to give up his farm and orchards. Poultry raising, dairying and the production of other crops tend, therefore, to stabilize the fruit industry.

## Apple Mildew

POWDERY mildew of the apple is a very serious disease in some sections. It is worse in the Rocky Mountains westward than through the east. It occurs more in the drier sections of the western part of our continent than in the humid sections. In portions of the Rocky Mountain district, Pacific Northwest and California this disease at times becomes very serious. It is especially bad on such varieties as Jonathan, Grimes, Spitzenburg and Rome. It attacks the young growing shoots, giving them a white, powdery appearance. It inhibits growth in these shoots and gradually kills off the young shoots. it does injury to the spurs. It will also attack the fruit, making sort of a white spiderweb-like network on the fruit.

In most sections where this disease is bad, it is found that lime sulphur, summer strength, can be combined with other sprays and will handle the mildew very nicely. Where one is spraying for mildew alone, the lime sulphur should be used at the time of the delayed dormant spray, at the strength of 1-30; on the pink spray, 1-40; on the calyx spray, 1-40, and on the ten day and thirty day spray, a strength of 1-50. In the Inland Empire of the Pacific Coast four sprays are generally given at a strength of about 1-50. These are at the pink; when the petals fall; about ten days to two weeks later, and the last one about four weeks after the calyx spray. These sprays are said to give very good control of this disease.

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## Some Hints on Grafting

(*Continued from page 10*)

and that the cions must be inserted deeply enough so that the top of the wedge is about on a level with the cut end of the stub.

When the stub is large enough two cions are used, one at either edge of the cleft. The two cions will help to heal over the cut surface more quickly and if one should fail to unite or be broken out it is likely that the other will live. After the cions have been placed and the wedge withdrawn the cut surface and the split in the stock must be completely coated with the grafting wax and a dab of wax on the cut end of the cions will not be amiss. The wax may be kept pliable by immersing in warm water.

After the cions have grown for one or two seasons the weakest of the two, or the one having the poorest position, should be removed. The remaining cion will probably make a very rank growth so care should be taken to see that it does not become too long and leggy.

When it becomes desirable to graft smaller limbs or to root graft as done with nursery stock, the splice or whip graft is commonly used. In this both stock and the lower end of the cion are cut in a slanting manner so that the cut surface is about an inch and a half long. A tongue is next cut in both surfaces and the two are then fitted together, and in such a manner that the growing layers on one side coincide. As the tongues on the two parts engage one with the other they are held together rather firmly, but a wrapping of twine about the union is commonly used.

A bark graft is made in much the same manner as the cleft, but with this difference; after the stub has been prepared the cion is shaped and then forced in between the bark and wood. Several cions may be used in the same stub if desired. These grafts are more likely to be blown out after they have made vigorous growth and this is probably the reason why the method is not more often used.

In top-working over a tree of any considerable size it is not considered to be a good plan to graft all of the limbs at the same time. A tree always needs a large leaf surface, consequently the removal of most of the branches would be a severe check to its developmnt. Then again, the exposure of the remaining limbs to the action of the sun may result in sunscald and subsequent canker diseases. For these reasons, it usually is best to graft a third of the limbs the first season and so take three years to complete the work.

### Bridge Grafting

Now that mice have become such important orchard pests in many sections of the country there are frequent calls for information in regard to bridge grafting in order to save girdled trees. One of the best and quickest plans for doing this work is as follows:

First, pare away the injured bark from around the edge of the wound; then plant a number of seedling or small yearling apple trees around the base and close to the injured tree, perhaps six, for a tree six inches in diameter that has been completely girdled. The seedlings are now bent over to the tree and where they touch the upper edge of the wound notches are cut in the bark and the bodies of the seedlings are fitted into them and held in place with boards or small nails. However, before the seedling is nailed to the tree its bark must be cut down to the growing layer where it comes in contact with the growing layer in the notch that has been cut in the bark of the large tree. The entire wound should now be thoroughly waxed and the job is complete. The tops are not cut off of the seedlings until the following season, and the fact that they are left on is apt to insure a union and a satisfactory result.


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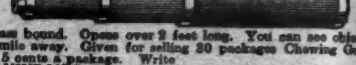

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# DO YOU KNOW WHY
## THE GEAR-SHIFT IS DIFFERENT?

The design of Dodge Brothers gear-shift takes into consideration the natural inclinations of the driver.

To start, you throw the lever forward. To reverse, you pull the lever backward. And when the car is running in high gear—which is about ninety per cent of the time—the lever is in a forward position, out of the way, where it does not interfere with passengers, robes, or luggage.

Moreover, the transmission, developed and patented by Dodge Brothers, is so designed that the countershaft—used in intermediate speeds and in reverse—is disconnected when the car is in high. There are no gears in mesh. Power is transmitted directly from clutch to rear axle.

This exclusive feature prevents the loss of power through friction, reduces gear-box noises and eliminates a vast amount of wear.

That is why the gear-shift of Dodge Brothers Motor Car *is different*.

DODGE BROTHERS

***The price of the Business Sedan is $1195 f. o. b. Detroit***

***Patents Pending***

These illustrations, made from actual photographs, show apple branches sprayed with lime sulfur. The branch on the left shows the result of the ordinary method—that on the right the perfect spread with Kayso added.

KAYSO
SPRAY SPREADER & ADHESIVE

*For Your Dormant, Delayed-dormant, Pink and Cluster-bud Sprays*

Without Kayso

With Kayso

# Spreads the Spray and Makes It Stay

KAYSO added to your spray mixtures and solutions gives a complete, unbroken, durable coat of insecticide and fungicide. The fruit grower can insure against heavy crop losses by using Kayso in every spray.

Kayso gives efficiency and economy in Dormant, Delayed-dormant, Pink and Cluster-bud sprays—applied to control such pests and diseases as San Jose Scale, Psylla, Red Spider, Blister Mites, Thrips, Aphids, Red Bug, Twig Borers, Leaf Rollers, Scab, Brown Rot, Leaf Curl and Leaf Spot.

## KAYSO SPREADS THE SPRAY

Kayso makes the spray spread in an even unbroken coat over every surface, thereby giving much better control of pests and diseases than is obtained when Kayso is not added—for the ordinary spray collects in scattering spots with numerous unprotected areas between.

## MAKES THE SPRAY STICK

Kayso causes the spray to adhere persistently to bark, buds, leaves and fruit, thereby giving much greater protection than can be obtained from the ordinary spray, which washes off with comparative ease during rains.

## SIMPLICITY AND ECONOMY

Kayso added to the spray mixture or solution makes the spray apply easily and cover quickly—causes the spray to set instantly and dry rapidly without excessive run-off waste, and gives increased coverage of as much as 10 to 25 percent.

## THE SPRAYMAN'S PROBLEM

An important problem of the sprayman is to know with certainty when a tree has been sprayed enough. After drying, the spots of poison are conspicuous but, while spraying, the drops of spray are difficult to see. Thus the tree often gets a second, third, or even fourth dash from the nozzle, with the result that the drops run off and waste on the ground, and the protection is impaired rather than increased. Furthermore, much run-off is bound to occur when the spray is made to carry to the central and distant parts of the tree.

## STOP THE WASTE

By using Kayso every drop of spray that strikes the tree flattens into a film. The surface wets immediately and is instantly recognizable to the sprayman. The film become fixed the moment it forms; it does not drain or continue to spread or get thinner. Further spraying adds to the thickness of the film and gives increased, rather than decreased, protection to the surface. The setting property of Kayso prevents loss of any insecticide or fungicide material, or reduces it to the minimum.

DEALERS ATTENTION: *Fruit growers, truck gardeners, vineyardists, florists—are in the market for Kayso. Be ready to supply your trade. Kayso is advertised nationally and is used throughout the United States. Correspondence invited.*

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